DPM-700
OPERATOR'S
HANDBOOK

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GLOSSARY ....

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Section 1
General Description

OVERVIEW

This section of the manual gives you a general overview of your DPM-700 Digital Picture Manipulator.

Subjects Covered:

- Video Input Signals
- The Transformed Key Signal
- Changing Picture Size, Shape, and Position
- Creating Motion Paths
- Video Output Signals
- Quick Reference Feature Checklist
- Standard Features
- Options
- Physical Configuration

INTRODUCTION

Your DPM-700 Digital Picture Manipulator is an ideal tool for creating striking and beautiful video effects. It has been designed to emphasize picture quality, versatility, and user-friendly control.

What the DPM-700 can do for You

The DPM-700 lets you change the appearance of video and makes it move in programmed patterns; all of this takes place in full three-dimensional (3D) space.

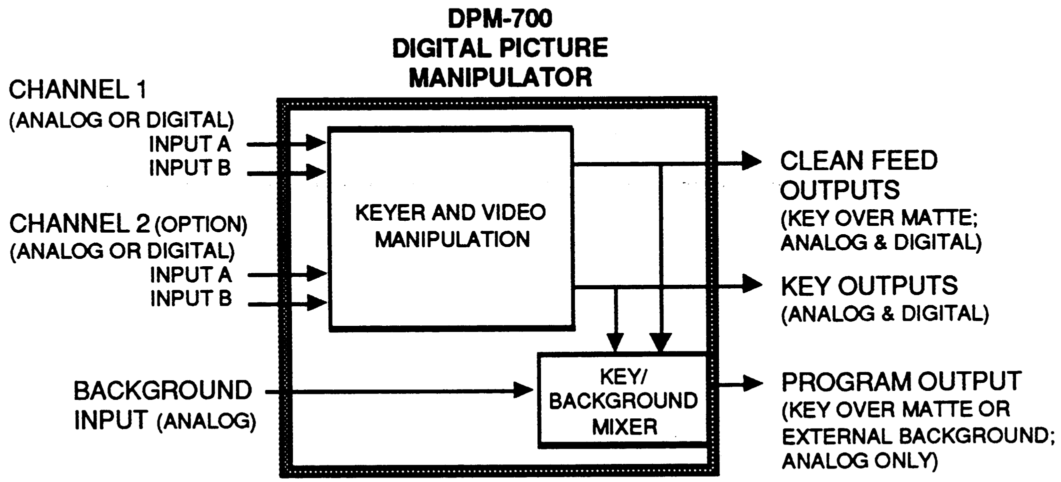
To explain in more detail, the DPM-700 can:

- select one or more video input signals and digitize them,
- manipulate them to change their size, shape and/or position,
- simultaneously process them into a transformed key signal,
- create motion paths for the changing shapes to follow,
- and then output the new video images and key signal to the next stage of your system.

The picture on Page 1-3 shows a simplified diagram of the signal path through the DPM-700.

Video Input Signals

A standard DPM-700 comes with a single channel, Channel 1, which has two separate inputs: A and B. You can add an optional Channel 2 which has its own A and B inputs. Both channels are available in either analog or digital format; you choose the format at the time of purchase.


DPM-700
DIGITAL PICTURE
MANIPULATOR
CHANNEL 1
(ANALOG OR DIGITAL)
INPUT A
INPUT B
CHANNEL 2 (OPTION)
(ANALOG OR DIGITAL)
INPUT A
INPUT B
BACKGROUND INPUT (ANALOG)
KEYER AND VIDEO MANIPULATION
KEY/ BACKGROUND MIXER
CLEAN FEED OUTPUTS
(KEY OVER MATTE; ANALOG & DIGITAL)
KEY OUTPUTS
(ANALOG & DIGITAL)
PROGRAM OUTPUT
(KEY OVER MATTE OR EXTERNAL BACKGROUND; ANALOG ONLY)

INPUTS CAN COME FROM:
- CAMERAS
- CHARACTER GENERATORS
- SWITCHERS/ROUTERS
- VIDEO TAPE RECORDERS
- ETC.

OUTPUTS CAN GO TO:
- MONITORS
- SWITCHERS/ROUTERS
- VIDEO TAPE RECORDERS
- TRANSMITTER
- ETC.

General System Configuration: *These are some of the ways the DPM-700 can fit into your system.*

Video Input Signals (cont)

Note that the channels can be configured differently; that is, you can use one for analog inputs and the other for digital inputs, giving you maximum flexibility in designing your system.

Input signals to the DPM-700 can come from cameras, edit suites, character generators, switchers and routers, video tape recorders, or other video devices.

Video Input Signals (cont)

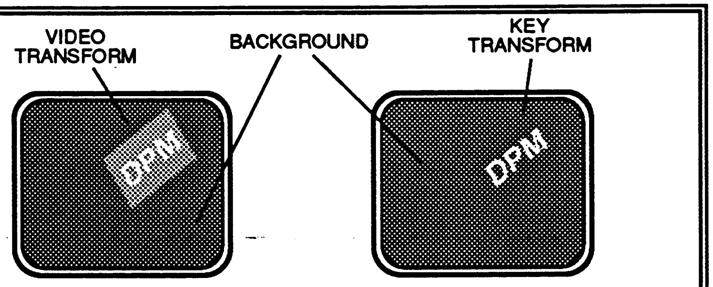
Several options are available from Grass Valley Group which multiply the number of possible inputs to the DPM-700.

- The DPM-733/733-2 and DPM-733CV/ 733CV-2 are 10 x 1 Input Selectors which let you connect up to ten different inputs per channel and then select them from the DPM-700 control panel.
- If you have a Model 200 switcher with Auxiliary buses installed, you can use them to provide inputs to your DPM-700; use the Model 200 control panel or the Satellite control panel to select these inputs.

The Transformed Key Signal

A "key" signal is a type of video signal which can be used to create a layered effect. In a sense, the key signal "cuts a hole" in the background and the fill video is inserted into the hole, as shown in the picture on the next page.

The key signal is created from an external input on one of the video channels, which can be a video or a key waveform or can be the shape of the transformed raster. The resulting key signal can be a linear key or a luminance key, depending on the KEYER selection. The key signal is transformed and manipulated in the same way as the video channel and is output as a linear key signal at the KEY OUTPUT.



A VIDEO TRANSFORM CONSISTS OF THE MANIPULATED VIDEO PICTURE (THE ENTIRE RASTER). IT IS OUTPUT AT THE CLEAN FEED OUTPUT AND AT THE PROGRAM OUTPUT WHEN IN DOWNSTREAM MODE. THE RASTER DEFINES THE KEY SHAPE AT THE KEY OUTPUT WHEN NO INPUT KEYING IS DONE.

A KEY TRANSFORM IS A LUMINANCE OR LINEAR KEY OF THE SELECTED VIDEO SOURCE, MANIPULATED AND TRANSFORMED LIKE THE VIDEO TRANSFORM. IT IS USED TO KEY THE VIDEO OVER A BACKGROUND, AND IS OUTPUT AT THE KEY OUTPUT.

Key Signal: *The DPM-700 processes video input signals into luminance or linear key signals.*

Changing Picture Size, Shape, and Location

As noted before, a standard DPM-700 comes with one complete channel, which can handle two separate video inputs. You can change from one input to the other during an effect. Possible video manipulations include the following:

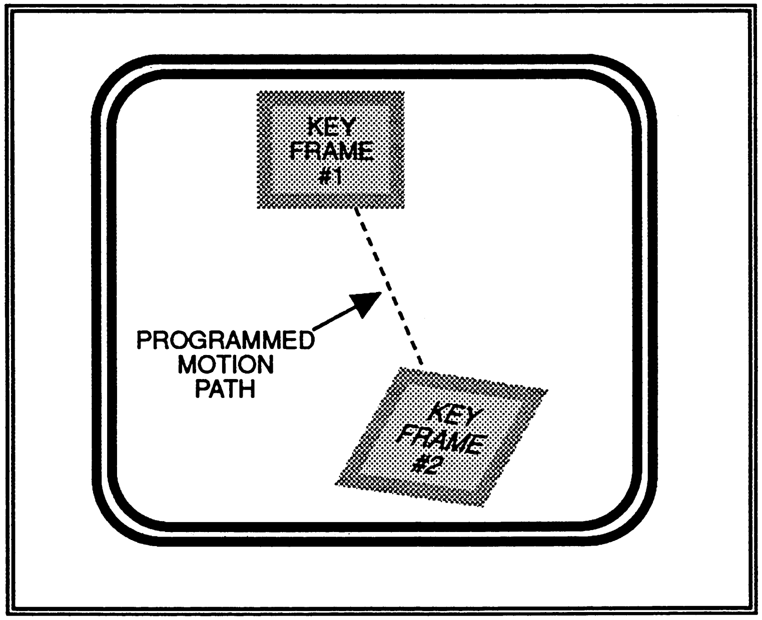
- positioning a picture in 3D space anywhere on the screen or entirely off-screen;
- sizing a picture from 0 times to 100 times its original size—X and Y values can be adjusted separately to change the picture's aspect;
- changing the picture's shape by skewing or slanting it;
- rotating a picture to any angle around the X, Y, and/or Z axes;
- programming a picture for multiple spins around a variable center in any direction.

Changing Picture Size, Shape, and Location (cont)

If you have a second channel, the possibilities are multiplied. The second channel does everything the first one does. In addition, it allows you to create effects which combine the two channels in layers.

Creating Motion Paths

You can program a complex motion path (called an "effect") by creating and storing a sequence of individual pictures or *key frames*. A key frame is a picture—one frame—defined at a particular point in time according to all possible picture parameters: position, size, sources, borders, etc.



Motion Paths: *Pictures can be programmed to move along intricate paths by setting up key frame sequences or "effects."*

Creating Motion Paths (cont)

Once you have entered a sequence of key frames, the DPM-700 will do the rest of the work for you by automatically calculating parameters for the picture at all points between key frames. These parameters control what happens to the video image and how it looks as it moves from one key frame to the next in the sequence. For example, if a picture is located in the center of the screen for Key Frame #1 and at the bottom of the screen for Key Frame #2, the DPM-700 will fill in the inbetween points to calculate a natural-looking motion path for you. The motion path can include spins, rotations, and other complex patterns of movement.

You can even program other manipulations to take place during the motion path effect. For example, the picture can change size or shape as it moves along the path. As with motion effects, the DPM-700 will calculate parameters for all points between key frames so that any changes in the picture appear to take place naturally.

Video Output Signals

After manipulation and motion programming, the video signal is fed to three output destinations as follows:

1) The KEY output is a black-and-white signal consisting of the white key shape inserted into a black background. It is available in both analog and digital form.
2) The CLEAN FEED output is a color signal consisting of the keyed video signal inserted into a black or matte background. It is available in both analog and digital form.

Video Output Signals (cont)

3) The PROGRAM output is similar to the CLEAN FEED output. It consists of the same keyed video signal, but it can be inserted into either the matte or an external analog background. The picture cursors for Channel 1, Channel 2, and Global can be displayed on this output and it can be faded to black (analog output only).

These outputs can be recorded or entered into another video device. Since the DPM-700 Digital Picture Manipulator can be ordered in four different television standards (NTSC, PAL, 525 line CV, 625 line CV), each with analog and/or digital inputs, it is compatible with most system configurations.

DPM-700 Functions and Features

Since every video production system is different, the DPM-700 has been designed for maximum flexibility so that it will function well in *your* system. It offers the most complete range of standard and optional features of any digital effects manipulator in its class.

DPM-700 Quick Reference Feature Checklist

- Available in Most Television Standards Without External Transcoding
- Choice of Analog and/or Digital Inputs
- Multiple-Motion Keyframing
- Rotation to Any Position Around the X, Y, and/or Z Axes PLUS Spin Around a Variable Center
- STREAMLINE™ Effects Controller
- Luminance/Linear Keys
- Powerful Transition Capabilities
- Standard E-MEM® Effects Memory System

DPM-700 Functions and Features (cont)

- Effect Dissolve
- Disk Drive System
- Extensive Serial, Peripheral, and General Purpose Interface
- Simple and Flexible Timing System
- Works in KeyLayer™ Mode With Any Switcher
- Works in KeyLink™ Mode With a Model 110/110CV Switcher
- Soft Border Generation
- Compact Size
- Built-in Diagnostics and Test Signal Generation
- Reliability and Ease of Maintenance
- Optional Second Channel Variable Priority Combiner
- Optional Recursive Memory With Montage and Trail Effects
- Optional External 10 x 1 Input Selector Which Can Be Fully Controlled By the DPM-700

Standard Features

Television Standards: You can order your DPM-700 already configured for either NTSC, PAL, Component 525, or Component 625 formats, making it easy to match your input standards. This flexibility means you won't need to add input and output transcoders to your system.

Analog/Digital Inputs and Outputs: All of the television systems—PAL, NTSC, 525-line and 625-line—can have either analog or digital inputs. You can mix input types in a two-channel system by using a different format on each channel. Internal digital decoders provide quality 4:2:2 processing. And all systems provide analog Key, Clean Feed, and Program outputs and digital Key and Clean Feed outputs.

Standard Features (cont)

Multiple-Motion Keyframing: You can program motion paths using key frames and then adjust the paths in very fine detail. Motion paths between key frames can be made to change instantaneously, at constant rates of speed, or at variable rates of speed. In fact, you can even select different parameters to change in different ways, all in one operation: for example, skew could be made to change at a constant rate while location changes instantaneously. The DPM-700 does all of the calculations for you.

Rotation and Spin: The DPM-700 takes full advantage of 3D space. You can rotate each picture to any position around its X, Y, or Z axis.

STREAMLINE™ Effects Controller System: Every DPM-700 comes with a STREAMLINE™ Effects Controller and Disk Storage System. This system is similar in operation to a computer. The system's display screen shows menus for different software programs which can be accessed and run. There are programs for controlling special video effects such as borders, mosaics, posterization and many others. In addition, the Effects Controller allows you to adjust setup and personality parameters to customize your system and to run built-in diagnostic programs.

Linear Downstream Keyer: The DPM-700 has a standard analog linear keyer built-in; you don't have to tie up a keyer in your switcher in order to key the picture over an internal matte background or over external background video. This simplifies system hook-ups, as well as adding an extra level of keying power.

Standard Features (cont)

Powerful Transition Capabilities: You can change from one output video to another in a variety of ways, while maintaining complete control over your effect, using the DPM-700's versatile transition effects. Cut, automatic, and manual (lever arm) transitions are available for key frame transitions, keyer transitions, Combiner (two-channel) transitions, and fade-to-black transitions.

E-MEM® Effects Memory System: The E-MEM® system gives you immediate and accurate storage and recall of key frame effects. Each effect can be up to 150 key frames in size per E-MEM® register; the E-MEM® system can hold a total of 600 key frames.

Effect Dissolve: The DPM-700's Effect Dissolve function lets you delay the start of an effect when you run it so that you can change gradually to the first key frame over a period of time instead of snapping to it abruptly. That is, instead of going immediately to the first key frame of the effect, the DPM-700 will "dissolve" or change gradually from its existing state to the state of the first key frame, using whatever rate is set for the Effect Dissolve function. This rate can be from 0 fields (a cut) to 99,999 seconds. You can use Effect Dissolve whenever you run an effect, whether it's in the current effect space or stored in an E-MEM® register.

Built-in Disk Drive for Extra, Non-Volatile Storage: Your DPM-700 includes a standard disk storage system which you can use to store and recall E-MEM® effects and system setup, timing and personality settings. The system comes with a diskette which contains a number of pre-programmed effects for you to choose from, either to run as they are or to edit to create new effects.

Standard Features (cont)

The disk drive is also used for loading system operating software and performing some diagnostic functions. Because the disk drive is actually part of the control panel, it is always right there for you to use.

Extensive Serial, Peripheral, and General Purpose Interface (GPI): The DPM-700 system includes ports for control of external input selectors, Model 100/110 switchers, Model 200 switchers and outgoing GPI signals, as well as for interface with edit controllers and for incoming GPIs. This means maximum flexibility and minimum complications when you're connecting a DPM-700 into your system.

Convenient Size: The DPM-700's electronics frame is compact enough to fit into even small operation sites, such as remote and mobile applications.

Flexible Timing System: Each input channel to your DPM-700 can be independently timed. The timing of the DPM-700's output (transformed images) can be adjusted with respect to the house reference. You can even store different output timing values and switch between them quickly and easily whenever you need to.

KeyLayer™ Upstream/Downstream Operation: The DPM-700's flexible timing system is particularly valuable when you're operating your DPM-700 with a switcher: you can use one time setting to send transformed pictures to the switcher for "upstream" manipulation; then, instead of re-cabling, you can switch to another setting which has been timed to the output of the switcher for "downstream" operation. For details

Standard Features (cont)

and diagrams, refer to the "Typical System Configurations" heading in Section 2 of the DPM-700 Service Manual.

KeyLink™ Mode Operation: Grass Valley Group's Model 110 Production Switcher has a special KeyLink™ feature which allows an external key or a chroma key from the Model 110 to be sent out to a digital picture manipulator for transformation. The transformed video and key is then returned to the Model 110, where it can be keyed in over the Program or Preset background and have a downstream key added. The DPM-700's software has been designed to operate closely with KeyLink™ by performing much of the setup for you automatically, with a single press of a pushbutton.

Soft Border Generation: The DPM-700 has built-in matte generators for border colors. Border adjustment is very flexible: you can change the width of any or all edges and can adjust the border softness.

Test Signal Generation and Diagnostics: The DPM-700 is designed to make alignment and troubleshooting easy. Internally-generated test signals and built-in diagnostic programs verify optimum system performance and reduce down time if a problem should occur.

Reliability and Ease of Maintenance: The DPM-700 is designed with a minimum of adjustments to keep maintenance requirements low. It uses Grass Valley Group parts and designs for superior performance and durability.

Standard Features (cont)

Key Channel or Second Video Channel Capability: You can easily install a second channel to double the video processing abilities of the system, and more than double the creative power. The second channel is identical to the first and can be separately controlled, but its real strength lies in using the two in combination. The Second Channel Combiner function allows you to dissolve between channels and change which one appears in front; this makes it appear that one picture is passing through the other. You can also create fascinating shadow effects by using one channel as a shadow for the other, and either channel can fly a key signal with a video signal from the other channel.

Options

Second Channel: The Second Channel option consists of a second Digital Video Processor Module, a Combiner Submodule, and a second Input Submodule. The Input Submodule can be selected in either analog or digital format.

Recursive Memory: The Recursive Memory adds a full frame of memory to the system, giving you the ability to do montages, trails and decays. This option is a submodule which installs on the Control Processor Module in the electronics frame.

External 10 x 1 Input Selector (one per channel): A 10 x 1 analog input selector with looping inputs is available for both composite and component versions of the DPM-700. It is controlled from the DPM-700 control panel. This option eliminates the need for manual external routing to the DPM-700's built-in inputs. It also allows precise

Options (cont)

"on edge" switching between up to ten different input sources.

Disk Remote Kit: You will need this option if you are going to obstruct access to the disk drive located in the left side of the panel, perhaps by placing another piece of equipment there. The Disk Remote option allows you to remove the disk drive and mount it outside the control panel. The option consists of a one-rack-unit high, rack-mountable housing; a six-foot shielded extension cable; two cable adapter sets; and a connector bracket to close up the disk-drive hole in the control panel. If you are going to install your control panel in a rack or drop it into a console, order the Rack Mounting Kit option, which includes a Disk Remote Kit.

Control Panel Rack Mount Adapter: This option allows you to mount the DPM-700 control panel in a standard 19" equipment rack. Mounting the panel requires eight rack units of space (14"). The mounting hardware allows you to adjust the tilt and height of the panel in the rack. Because mounting the panel in a rack may block access to the disk drive, the Rack Mount option includes a Disk Remote Kit.

Spare Service Manual Set: This option includes one complete two-volume set of Service Manuals (the DPM-700 is shipped with one set). The Service Manuals describe the options as well as the standard system.

Spare Operator's Handbook: This option consists of a spare copy of the DPM-700 Operator's Handbook, which describes all system operations

Options (cont)

and includes tutorials and quick-reference materials. (The DPM-700 is shipped with one copy of the Handbook.)

Extender Board Set: This option includes two module extender boards: one extender is for digital modules and the other is for analog modules.

NOTE: *Extender boards are not included with the standard system. We suggest that you purchase an extender set if you plan to service your own DPM-700 system.*

Spare Power Supply: This option provides one complete power supply. The DPM-700 can be connected to only one power supply at a time, so this option is a spare, not a redundant, power supply.

Spare Module Kit, Analog or Digital: The Spare Module Kits include a set of the system-level modules which are most useful for emergency replacements and for troubleshooting. The kits do not include options. Be sure to order the version which matches your basic DPM-700 system (specify analog PAL, analog NTSC, analog Component 525, analog Component 625, digital PAL, digital NTSC, digital Component 525, or digital Component 625).

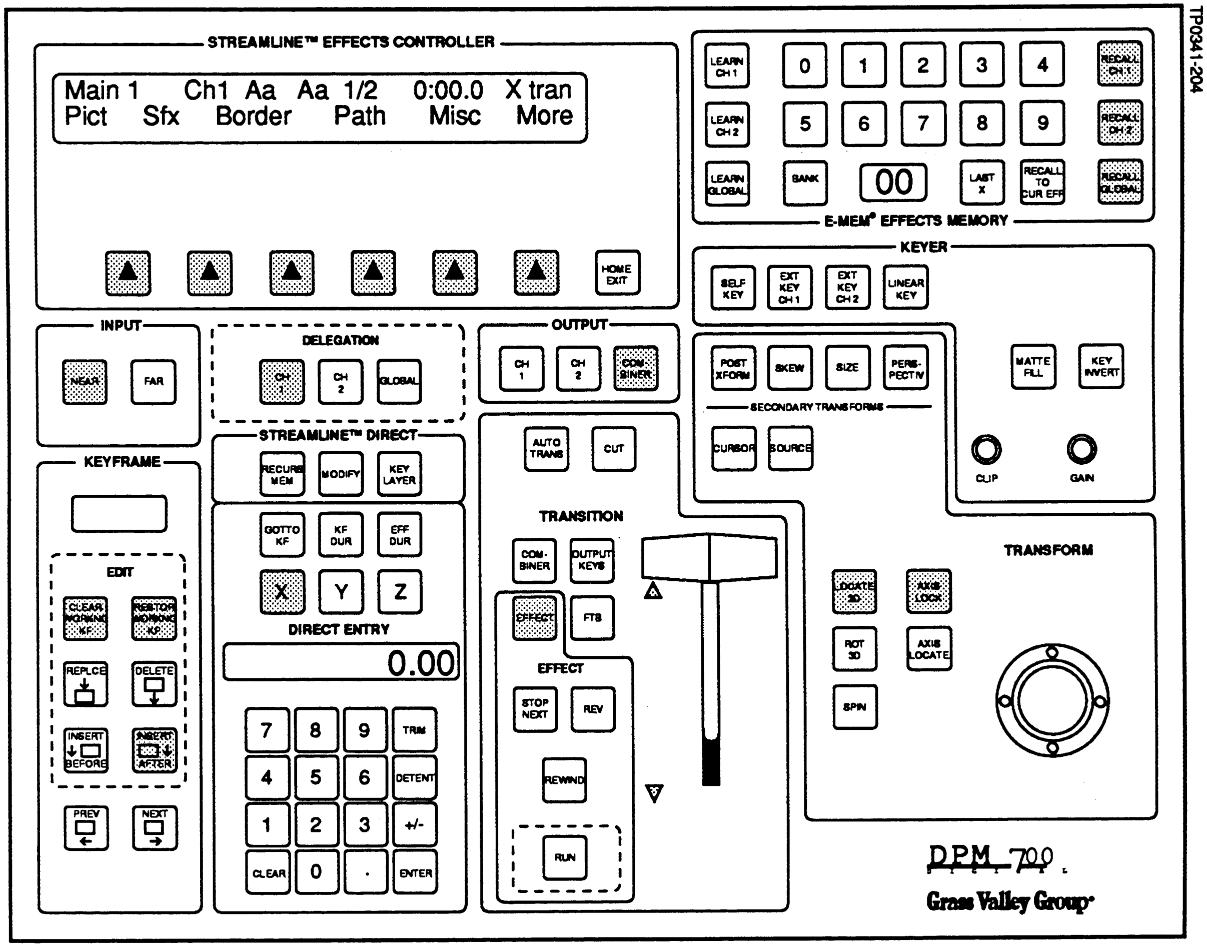
Physical Configuration

The DPM-700 consists of a control panel and an electronics frame. They are connected by a single 15-conductor, full-duplex serial communications control cable which also provides power to the panel. This cable can be up to 100 meters long.

The control-panel is designed to be used-on a desk or console top. The panel contains a disk drive located in its left side, so you should leave room for inserting and removing disks. If desired, you can use the optional Rack Mount Adapter Kit to install the panel in a standard 19-inch equipment rack or drop it into a console. Since this may block access to the disk drive, the Adapter Kit includes a Disk Remote Kit which lets you remove the disk drive and mount it outside the control panel.

The DPM-700 electronics frame is four rack units high (6.96 inches/17.68 cm) and mounts in a standard 19-inch-wide (48.3 cm) equipment rack. The frame contains three standard electronics modules: a Control Processor Module, a Digital Video Processor Module, and an Interface Module. There is also a slot for a second Digital Video Processor Module for the optional second channel.

The power supply for the DPM-700 frame and the control panel is located in the frame on the left side. There is an on/off switch for the power supply at the front of the frame. The same area holds fans which provide cooling for the unit. Input voltage for the supply is user-selectable and can be either 90-132 volts or 180-264 volts at 50/60 Hz.


TP0341-204
STREAMLINE™ EFFECTS CONTROLLER
Main 1 Ch1 Aa Aa 1/2 0:00.0 X tran
Pict Sfx Border Path Misc More
HOME EXIT
LEARN CH 1
LEARN CH 2
LEARN GLOBAL
0
1
2
3
4
5
6
7
8
9
BANK
00
LAST X
RECALL TO CUR EFF
RECALL CH 1
RECALL CH 2
RECALL GLOBAL
E-MEM® EFFECTS MEMORY
KEYER
SELF KEY
EXT KEY CH 1
EXT KEY CH 2
LINEAR KEY
POST XFORM
SKEW
SIZE
PERS-PECTIV
SECONDARY TRANSFORMS
CURSOR
SOURCE
MATTE FILL
KEY INVERT
CLIP
GAIN
INPUT
NEAR
FAR
DELEGATION
CH 1
CH 2
GLOBAL
OUTPUT
CH 1
CH 2
COM-BINER
STREAMLINE™ DIRECT
RECURR MEM
MODIFY
KEY LAYER
GOTTO KF
KF DUR
EFF DUR
X
Y
Z
DIRECT ENTRY
0.00
7
8
9
TRIM
4
5
6
DETENT
1
2
3
+/-
CLEAR
0
.
ENTER
KEYFRAME
EDIT
CLEAR WORKING KF
RESTORE WORKING KF
REPLCE
DELETE
INSERT BEFORE
INSERT AFTER
PREV
NEXT
AUTO TRANS
CUT
TRANSITION
COM-BINER
OUTPUT KEYS
EFFECT
FTB
EFFECT
STOP NEXT
REV
REWIND
RUN
TRANSFORM
LOCATE 3D
AXIS LOCK
ROT 3D
AXIS LOCATE
SPIN
DPM 700
Grass Valley Group

DPM-700 Control Panel Start-up State *(Grey-shading indicates key is lit).*

Section 2
Tutorial—Basic Effects

INTRODUCTION

This section of the manual is designed to step you through all of the basic functions of the DPM-700. Each function is described in a lesson which includes a general description of the operation and specific instructions which you can use as a hands-on tutorial. The lessons are arranged as follows:

Transform Operations:

1. Picture Size and Aspect
2. Locating (Positioning) a Picture
3. Assigning Inputs to the Near and Far Sides
4. Rotating and Spinning a Picture
5. Operating in Source Mode
6. Adjusting the Perspective of a Picture
7. Using Post Transform to Maintain a Fixed Point of View
8. Skewing (Slanting) a Picture
9. Trimming X, Y, and Z Values
10. Detent Values

INTRODUCTION (cont)

Key Frame Operations:

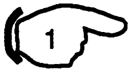
11. Creating a Key Frame Effect
12. Learning (Saving) and Recalling Effects using E-MEM® Registers
13. Running and Reviewing Key Frame Effects
14. Changing the Key Frame Duration
15. Inserting a Key Frame into an Effect
16. Deleting (Removing) a Key Frame from an Effect
17. Replacing a Key Frame in an Effect
18. Key Frame Path Control
19. Using the Global Channel and Transforms

Special Effects:

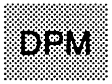
20. Cropping the Sides of a Picture
21. Placing a Border around a Picture
22. Picture Color Effects
23. Special Effects
24. Using Keys
25. Fade to Black Transitions
26. Disk Storage of E-MEM® Registers and Setup

PICTURES USED IN THE LEFT-HAND COLUMN

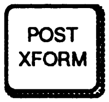
The narrow left-hand column of each page uses pictures to show you how to perform each operation. Each picture represents an action, a panel control, or a DPM-700 effect as follows:



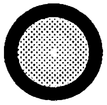
Each hand icon indicates one step of an operation. The number in the hand tells which step. If you want further details about that step, look for the same number in the right hand column.



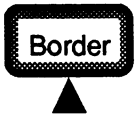
This logo is used to represent the picture being manipulated by the DPM-700. It will sometimes be shown in a modified form as an indication that it has been manipulated. For example, it may be shown slanted or bordered.



Each small square represents a control panel pushbutton. The name of the pushbutton is written in the square exactly as it appears on the panel. When a pushbutton name is written in the text, it appears enclosed in brackets: [name].

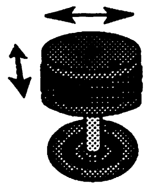


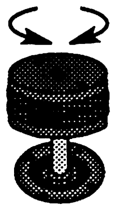
This circle icon represents a control knob. There are three on the DPM-700 panel: CLIP and GAIN in the KEYER section and the soft knob in the STREAMLINE™ section.



This picture represents a STREAMLINE™ "soft" pushbutton. There are six soft pushbuttons. Each one is marked with a black triangle which points upwards towards the STREAMLINE™ display. Because the soft pushbuttons change their names and functions depending on which software program you are using, the display also changes to show the pushbutton's current name. As a status indicator, most soft pushbutton names appear in all capital letters—for example, "CURSOR"—when they have been selected.

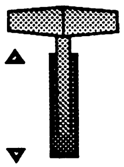
When a soft pushbutton name is written in the text, it appears enclosed in curved brackets: for example, {Cursor}.



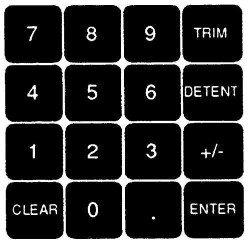


The joystick is located in the lower right-hand corner of the panel. It can be moved in three different directions to enter data:

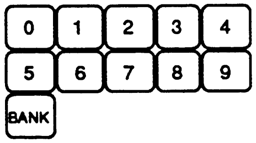
- Moving the knob left or right, as shown by the horizontal arrow above the first joystick, changes the X-axis value.
- The arrow to the left of the first joystick indicates that you should push the knob backward or pull it forward. This controls the Y-axis value.
- A joystick with two curved arrows above it indicates that you should turn the knob; this controls the Z-axis value.



The lever arm is in the TRANSITION section of the control panel. It can be delegated to either the combiner, the keyer, the fade to black function, or the key frame effect function to perform manual transitions.



This icon represents the keypad in the DIRECT ENTRY section of the control panel. The numbers are used to enter numerical data. [ENTER] confirms the data entry.

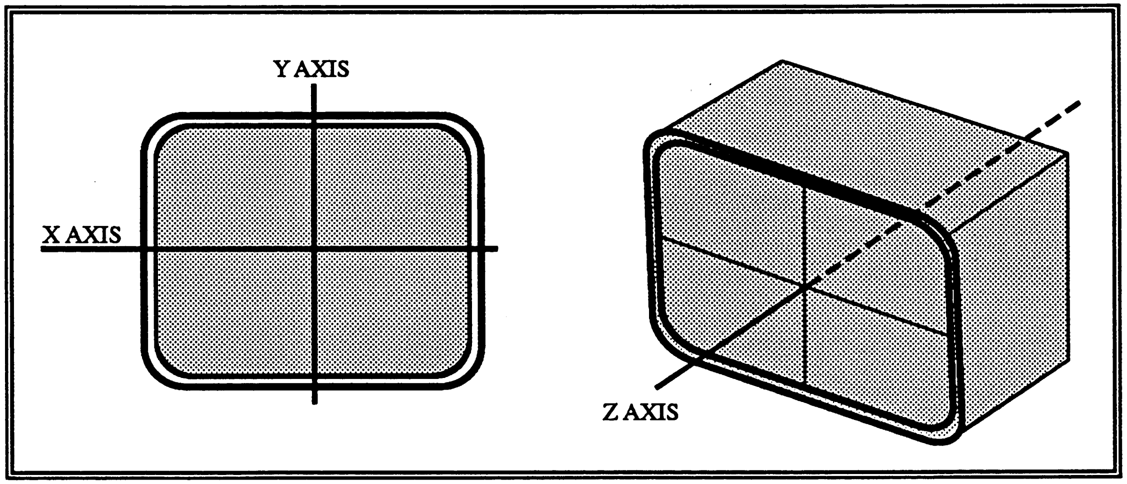


This icon represents the keypad in the E-MEM® EFFECTS MEMORY section of the control panel. [BANK] selects bank 0-9. The numbers are used to learn key frame effects into memory registers 0-9 and to run or recall them later.

WORDS YOU'LL NEED TO KNOW

Digital effects systems have their own special vocabulary. A complete glossary is included at the end of this manual. Some of the most useful words for you to know are defined here as well as in the glossary.

axes: The X axis is a horizontal line through the center of the screen. The Y axis is a vertical line. The Z axis is perpendicular to the X and Y axes; it extends into the screen.



bank, register: The E-MEM® Effects Memory system contains 100 memory registers. These are divided into ten banks numbered 0-9. Each bank contains ten memory registers numbered 0-9. The E-MEM® display shows the bank number on the left and the register number on the right. For example, Bank 7, Register 0, will be shown in the display as "70."

WORDS YOU'LL NEED TO KNOW (cont)

effect, key frame effect: An effect is a series of key frames in sequence. The DPM-700 automatically defines what happens to the parameters between key frames to create a smooth transition from one to the next; this process is called *inbetweening.*

key frame: A key frame is a single picture—an instant of time. At that instant, the key frame defines all possible parameters, including picture size, shape, and position; sources; recursive effects; background; and borders.

soft panel, soft pushbutton, soft knob, soft display: The soft panel is the STREAMLINE™ control panel, which is located in the upper left-hand corner of the DPM-700 control panel. The soft panel is controlled by software instead of having dedicated functions. That is, the pushbuttons and knob do different things depending on which software program is currently running. The display labels the pushbuttons according to their current function and shows the program status.

transform: A digital picture manipulation which changes the appearance or location of the picture, such as sizing, skewing, or positioning.

INITIAL SETUP FOR THE TUTORIAL

Perform the instructions below to set your DPM-700 keyframe parameters to a known state:

1. In the DELEGATION section, press [CH 1], [CH 2], and [GLOBAL] at the same time; all three pushbuttons should light. This delegates the control panel to Channel 1, Channel 2, and Global Control so that you can set the parameters for all three to the default.

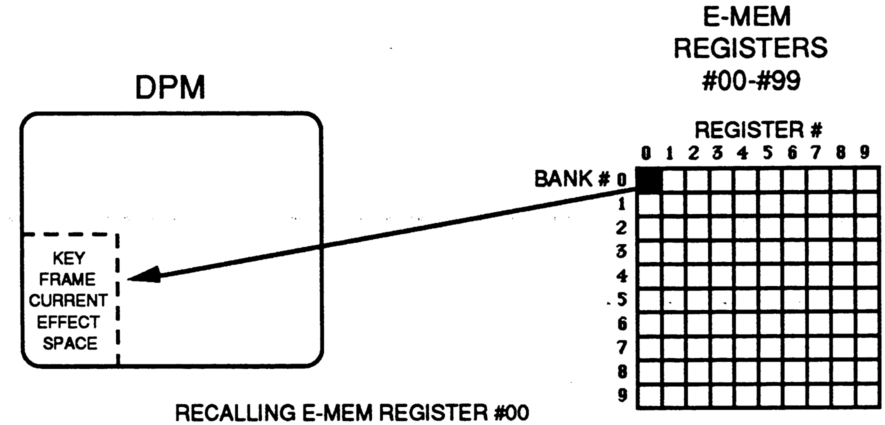
2. In the INPUT section, press [NEAR] and select Input A or another active input by pressing the pushbutton below the selection in the STREAMLINE™ display.

3. In the E-MEM® EFFECTS MEMORY section, select [RECALL TO CUR EFF]; the pushbutton will light when it is selected.

   Toggle [RECALL CH 1], [RECALL CH 2], and [RECALL GLOBAL] so that all three pushbuttons are lit.

   Press [BANK], [0], [0]. This recalls Effects Memory register #00 to the current effect space. Register #00 is always kept empty so that when it is recalled, it empties the current effect space.

4. In the KEYFRAME section, press and hold [CLEAR WORKING KF] for one second.

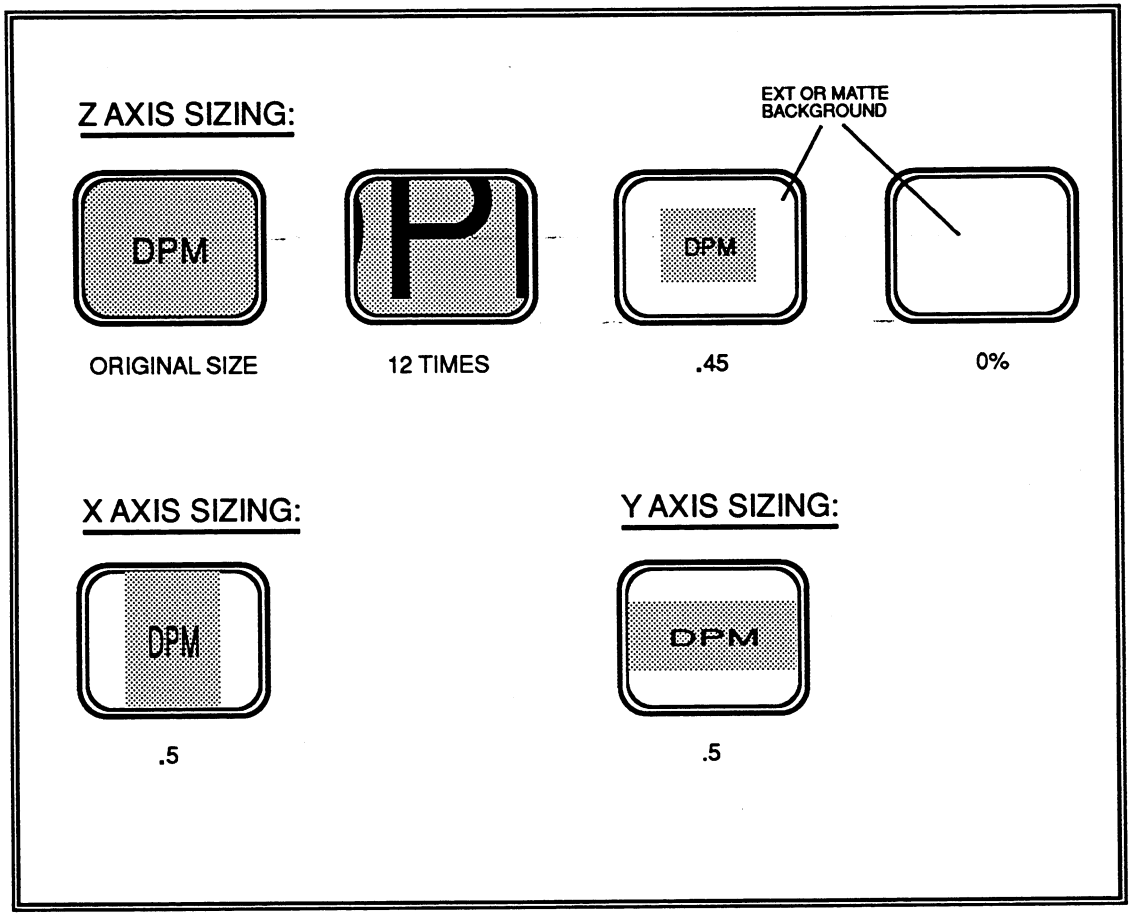

E-MEM
REGISTERS
#00-#99
DPM
REGISTER #
0 1 2 3 4 5 6 7 8 9
BANK # 0
1
2
3
4
5
6
7
8
9
KEY
FRAME
CURRENT
EFFECT
SPACE

RECALLING E-MEM REGISTER #00
TO THE CURRENT EFFECT SPACE
WILL ERASE THE CURRENT EFFECT.

INITIAL SETUP FOR THE TUTORIAL (cont)

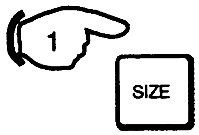
If the selected channel's video doesn't appear full screen (not manipulated or transformed) the Default Keyframe should be set by a qualified person. The setup selections are shown in the Personality {Person} menu tree in the Dictionary of Controls section of this manual.

LESSON 2-1:
PICTURE SIZE AND ASPECT

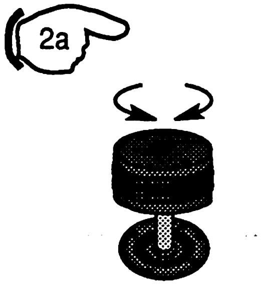

Z AXIS SIZING:
EXT OR MATTE BACKGROUND
DPM
ORIGINAL SIZE
12 TIMES
.45
0%
X AXIS SIZING:
DPM
.5
Y AXIS SIZING:
DPM
.5

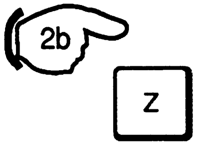
***Sizing Range:** You can adjust the picture from 100 times its original size down to 0% (no visible picture) along any axis. You can change the aspect of the picture by adjusting only its X or Y axis value.*

NOTE: Be sure Delegation is Channel 1 only.

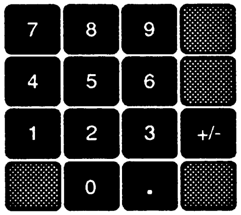


1. Select [SIZE] in the TRANSFORM section of the panel to transform the size of the picture.





then



then

There are three different controls you can use to adjust picture size: the joystick, the DIRECT ENTRY keypad, and the STREAMLINE™ soft knob.

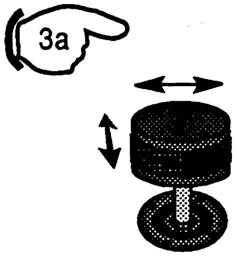
2. a. Turn the joystick knob; this adjusts the Z value. Turning the knob clockwise makes the picture larger; turning it counterclockwise makes the picture smaller.
   b. Select [Z] in the DIRECT ENTRY section. The [Z] pushbutton will light when it is selected, and will stay selected until you delegate the keypad to a different function. Use the keypad to enter a value between 0 and 100 and then press [ENTER].
      - Any value between 0 and 1 makes the picture smaller; for example, .45 will be 45% of the original size. Very small values will make the picture disappear.
      - A value between 1 and 100 makes the picture larger; for example, 12 will be 12 times larger than the original picture.
      - A value of 1 leaves the picture at its original full-screen size.

   Selecting [Z] also delegates the STREAMLINE™ soft knob to control the Z value for size; it operates similarly to the joystick.

   The current Z value is displayed above the keypad as long as Z is selected. This is true regardless of whether you use the keypad, the joystick, or the knob to set the value.

NOTE: *If you decide at any point that you do not want to enter the data you have keyed in, press [CLEAR] to erase it.*

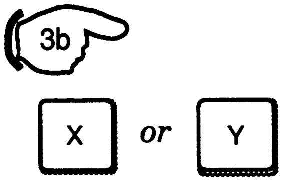
Adjusting the Z value for size adjusts the picture's size evenly, in proportion. You can scale or change the picture's size and aspect—the relative proportion of height to width—by adjusting the X and Y values unequally.



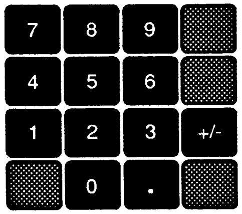
3. a. Move the joystick knob left or right to adjust the X size value: moving it left makes the picture smaller; moving it right makes it larger.

   Move the knob forward or backward to adjust the Y size value: moving it forward makes the picture smaller; moving it backward makes it larger.

   You can also use the soft knob to adjust the size/aspect if [X] or [Y] is selected in the DIRECT ENTRY section of the panel.



then

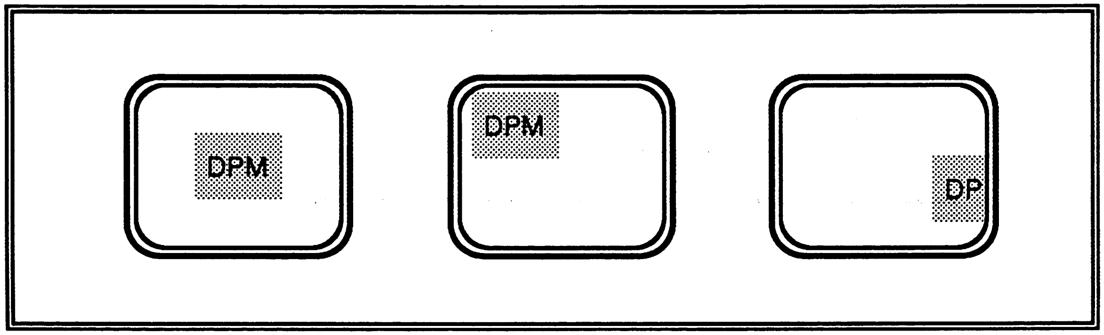


then

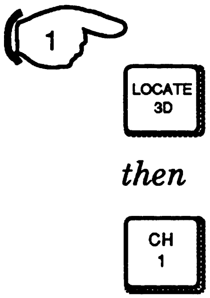
   b. With [X] or [Y] selected, use the keypad to enter a value between 0 and 100; press [ENTER].
      - Any value between 0 and 1 makes the picture smaller in the X or Y direction, relative to the Z value.
      - A value between 1 and 100 makes the picture larger; for example, "12" will make the picture 12 times larger than the original picture along the axis being adjusted.
      - A value of 1 leaves the picture at its original Z value size along the selected axis.

NOTE: For this tutorial, we suggest that you make the picture small—about 50% size (Z = .5)— so that it is easy to see what happens to it as you perform other manipulations.

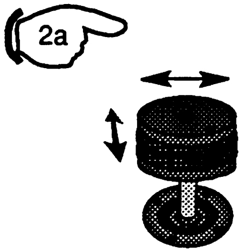
LESSON 2-2:
LOCATING (POSITIONING) A PICTURE



Locating a Picture on the Screen: *You can move the picture anywhere on the screen, or to a position partially or completely off-screen. Moving the picture along its Z axis makes it appear larger or smaller but does not actually change the size.*

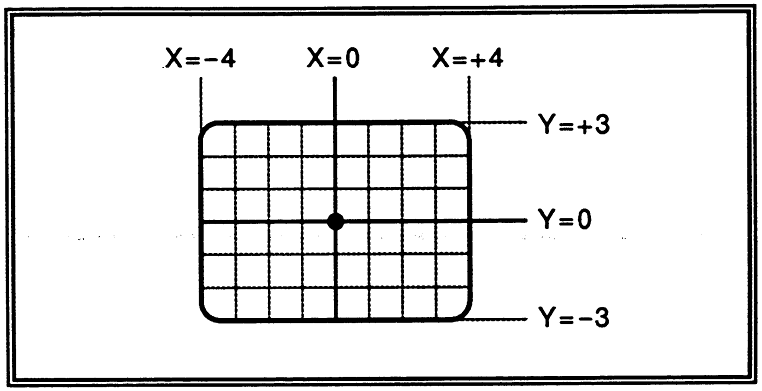


1. Before beginning this lesson, make sure [SOURCE] is off (not lighted) and that [AXIS LOCK] is on. Select [LOCATE 3D] in the TRANSFORM section of the control panel and select [CH1] in the DELEGATION section. You can use the joystick, the STREAMLINE™ soft knob, or the DIRECT ENTRY keypad to position the picture anywhere in three dimensions; you can even move it entirely off-screen.



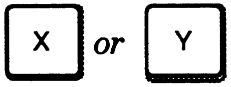
2. Changing the X axis location value moves the picture left or right. Changing the Y axis location value moves it up or down.
   a. Move the joystick in the direction you want the picture to move.

NOTE: *In normal mode ([SOURCE] off), the picture will move left/right and up/down relative to screen axes. If [SOURCE] is on, the picture will move relative to its own axes; for example, if the picture is rotated 180° so that it is upside down on the screen, its "up" will be down on the screen.*

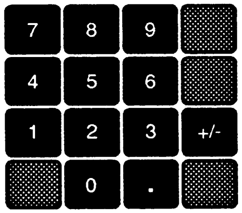


***The X-Y Grid:** In normal mode ([SOURCE] off), an object's location on the screen is defined by its position along the X and Y axes.*

2b



then

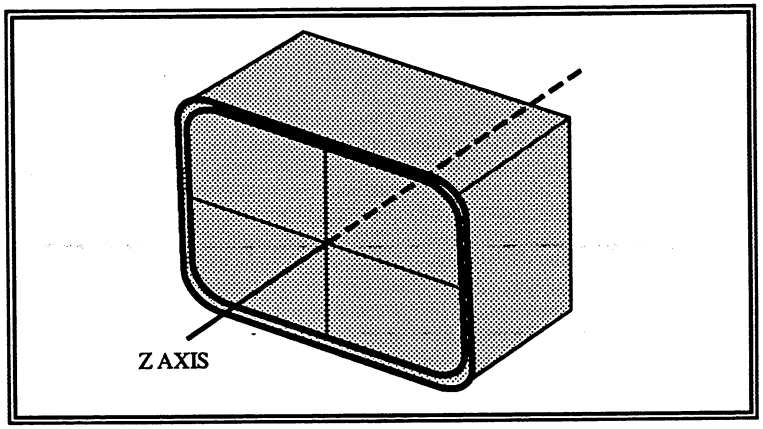


then

b. The viewing screen is divided into a grid eight units wide (X axis) by six units high (Y axis), as shown above. You can use the DIRECT ENTRY keypad to enter location values directly and position the DPM-700 picture along these axes.

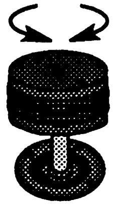
Select [X] or [Y], then enter a value using the keypad and press [ENTER]. The *center* of the picture will move to this new location. Note that X values greater than +/- 4 and Y values greater than +/- 3 will move the center of the picture off-screen.

***NOTE:** To quickly set all transform values of the delegated channel(s) to a known state, press [CLEAR WORKING KF] in the KEYFRAME section of the control panel. This sets the transform values (size / aspect, location, rotation, etc.) to default values; default values can be entered or changed using the STREAMLINE™ {Person} Menu.*



***The Z Axis:** An object's location in 3D space is defined by its position along the Z axis, which extends forward and backward from the plane of the screen at a 90 degree angle.*

3a

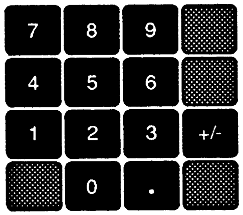


3. Changing the Z axis location value moves the picture closer to or further away from the front plane of the monitor screen (it can appear to be located closer to or further away from the viewer).
   a. Turn the joystick (or the soft knob if [Z] is selected) to adjust the Z axis location.
      - If Z=0, the picture is located on the Z axis so that it is full screen at unity size.
      - If Z is more than 0, the picture is further away from the viewer.
      - If Z is less than 0 the picture is closer to the viewer.

3b

Z

then



then

ENTER

   b. Select [Z], use the keypad to enter a value, and then press [ENTER]. The *center* of the picture will move to this new location along the Z axis.

***Note:** The viewer is theoretically -16.67 units away from the 0 reference, or screen plane. Values more negative than -16.67 will cause the picture to "wrap around" the viewer and reappear on the screen. To prevent this, enable {PClip} in the {Misc} menu.*

LESSON 2-3: ASSIGNING INPUTS TO THE NEAR AND FAR SIDES

WORKING WITH TWO INPUTS

When you use your DPM-700 to manipulate a picture, that picture has two sides like a sheet of paper. One side is designated as the *front* side and the other as the *back* side. The front and back side designations are necessary for spacial orientation.

- The **front** of the picture is the one which is visible when the system first starts up in the factory default. This side is always considered the front, even when it has been turned away from the viewer and is no longer visible
- The **back** side of the picture is not visible as the factory default; it is the one turned away from the viewer at the factory default.

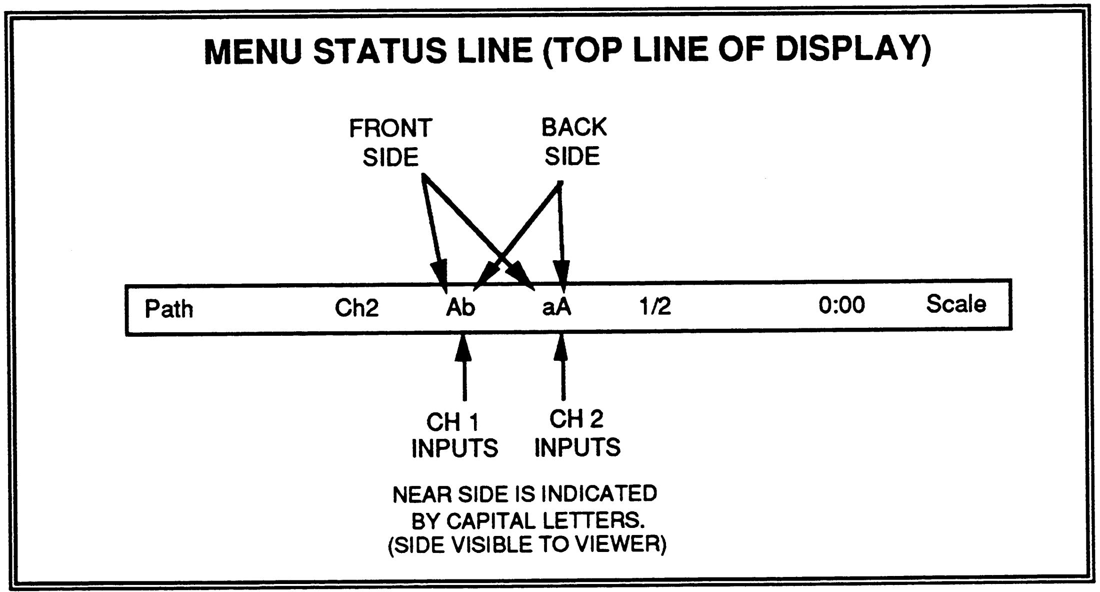
One side will always be turned towards the viewer and will be visible; this is called the **near side.** The other side will be turned away from the viewer and will not be visible; this is the **far side**. You can select any available video input to appear on either side.

- **Near** always refers to the side of the picture which is currently visible. The front side or the back side can be **near**est to the viewer. It is represented by the capitalized letter in the status menu.
- The **far** side of the picture is always the side turned away from the viewer.

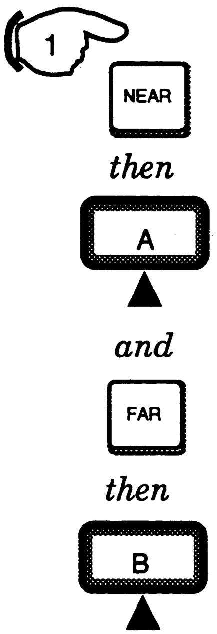
The top line of the status menu shows two letters to indicate the two inputs for each channel. The letter on the left indicates which input is assigned to the front side; the letter on the right indicates the input assigned to the back side. One of the two letters will be capitalized to indicate that it is currently the near or visible side. If the letter on the right is capitalized, for example, then the back side of the picture is currently facing the screen.

So far you have worked only with Input A, which was assigned to the near side of the picture as part of the set up for this tutorial. The DPM-700's second standard input, Input B, functions identically. You can assign Input B instead of Input A to either or both sides for any video manipulation and it will work in exactly the same way.

You can select either the same input or two different inputs for the near and far sides. For example, you can assign Input A as the near side of the picture and Input B as the far side. Then, each time the picture flips or tumbles, a different picture will be revealed.


MENU STATUS LINE (TOP LINE OF DISPLAY)
FRONT SIDE
BACK SIDE
Path
Ch2
Ab
aA
1/2
0:00
Scale
CH 1 INPUTS
CH 2 INPUTS
NEAR SIDE IS INDICATED BY CAPITAL LETTERS. (SIDE VISIBLE TO VIEWER)

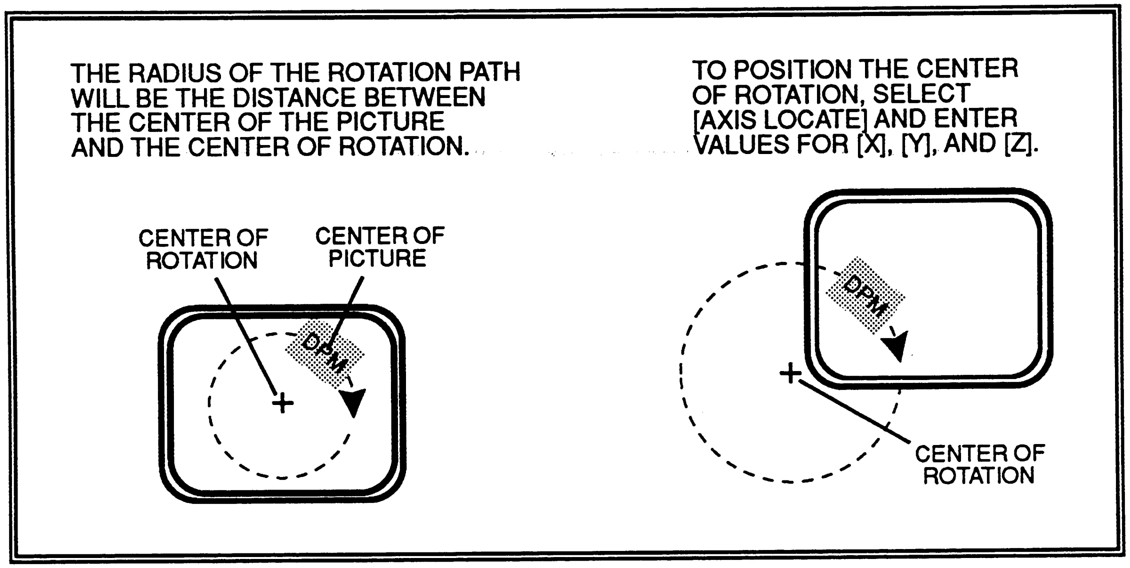
Input Status: *The top line of the STREAMLINE™ display shows which inputs have been selected as the near and far sides of the pictures and whether the front or back is visible.*



1. For this lesson, assign Input A to the near side of the picture and assign Input B to the far side, as follows:
   - Select [CH1] and press [NEAR] in the INPUT section of the control panel. Select Input A to be the near side by pressing the pushbutton under {A} in the STREAMLINE™ display.
   - Press [FAR]. Select Input B to be the far side by pressing the pushbutton under {B} in the STREAMLINE™ display.

NOTE: *If you are using an optional 10x1 input selector, the menu choices will be [A]-[J] instead of the standard [A] and [B]. If you are using a Model 200 Aux Bus as an input selector, you should use the Aux Bus control panel to select the inputs.*

LESSON 2-4:
ROTATING AND SPINNING A PICTURE



THE RADIUS OF THE ROTATION PATH WILL BE THE DISTANCE BETWEEN THE CENTER OF THE PICTURE AND THE CENTER OF ROTATION.

TO POSITION THE CENTER OF ROTATION, SELECT [AXIS LOCATE] AND ENTER VALUES FOR [X], [Y], AND [Z].

Rotating/Spinning the DPM-700 Picture: *You can rotate the picture around a central point at any angle in 3D space.*

The DPM-700 has separate rotation and spin functions to give you maximum control of a picture's circular movement around a central point.

- Rotation, selected with the [ROT 3D] pushbutton, is used for motion about an axis with a highly accurate motion path. A *rotation* motion path is calculated using quaternians. This method provides a truer motion path, but restricts changes from one keyframe to the next to ±180° of rotation (±.5).
- Spins, selected with the [SPIN] pushbutton, are used for multiple turns about an axis. A *spin* motion path is calculated using Euler angles (pronounced *oiler*), which allows multiple turns, but may have a slightly irregular motion path in some effects.

In the following lesson, the term *rotation* is used to refer to both rotation and spin operations.

All rotations on a channel—Channel 1, Channel 2, or Global—take place around a central point, which is referred to in the manual as the *center of rotation*. Each channel has its own, separate center point. The centers of rotation are shown on the screen by three different cursors, as follows:

+ Channel 1
✕ Channel 2
◎ Global channel

The center of rotation may be located within the picture itself or outside of it, as shown in the picture on the previous page. The kind of values you enter—X, Y, and/or Z—determines the axis of rotation.

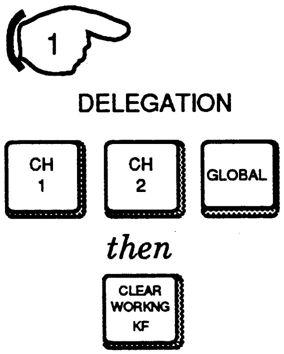
- Entry of values with [Z] selected in the DIRECT ENTRY keypad (or by turning the joystick knob) causes rotation around the Z axis.
- Entry of values with [X] selected (joystick left or right) causes rotation around the Y axis.
- Entry of values with [Y] selected (joystick forward or backward) causes rotation around the X axis.

There are basically three steps involved in setting up rotations and spins:

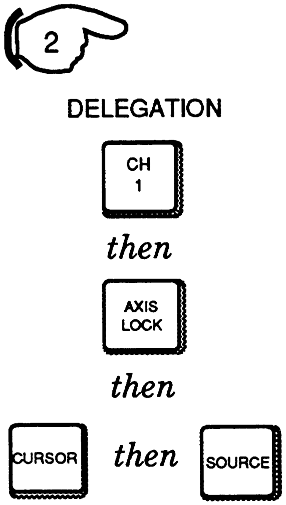
- Position the center of the picture. The radius of the rotation will be the distance between the center of the picture and the center of rotation.
- Position the center of rotation anywhere in 3D space, including off-screen.
- Perform the rotation.

Z Value Rotations

Rotations which change the Z value will make the picture rotate around the Z axis. Rotations around the Z axis appear to take place on a plane parallel to the screen plane, as shown in the picture below.

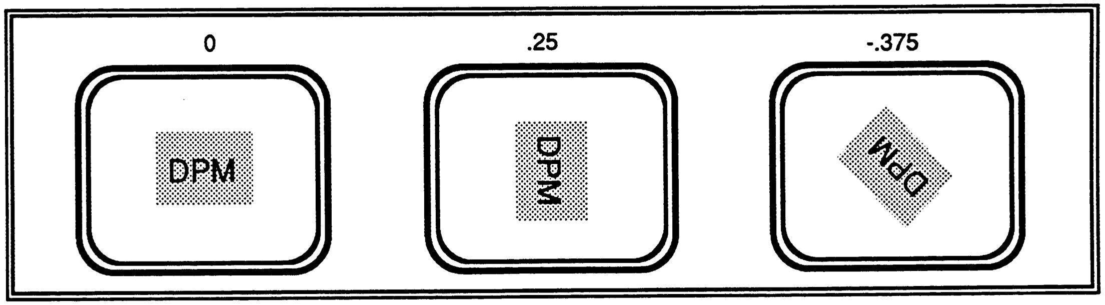

1
DELEGATION
CH 1
CH 2
GLOBAL
then
CLEAR WORKING KF

1. Delegate to channel 1, channel 2, and Global by pressing all three buttons at the same time in the DELEGATION section. Press and hold [CLEAR WORKING KF] for one second.

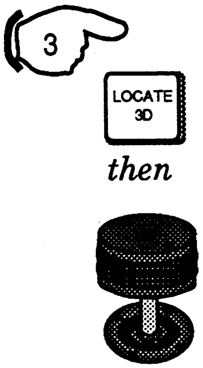

2
DELEGATION
CH 1
then
AXIS LOCK
then
CURSOR
then
SOURCE

2. Delegate to channel 1 [CH1] in the DELEGATION section; then toggle [AXIS LOCK], [CURSOR], and [SOURCE], so that all three buttons are lit.

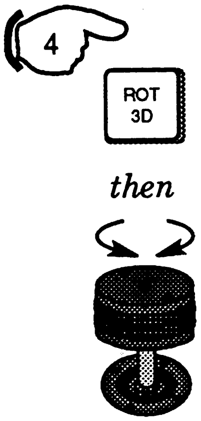
NOTE: *You will normally have the cursor on whenever you set up a rotation or spin. However, it will not be stored with the rotations and spins in a key frame effect. This is so that you can simply turn the cursor off to remove it from the screen when you are ready to produce your final output.*


0
.25
-.375
DPM
DPM
DPM

Z Axis Rotations: *Rotations around the Z axis appear to take place on a plane parallel to the screen plane. The center of rotation point can be inside the picture itself.*



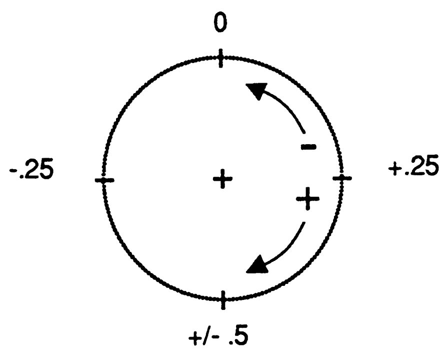
3. Press [LOCATE 3D] in the TRANSFORM section of the control panel and move the picture in 3D so that it appears further away and off to the side. Because [AXIS LOCK] is on, the center of rotation will remain at the center of the transformed picture. There are two ways to make the adjustments:
   a. Move the joystick knob in the direction you want the cursor to move: left/right is for X values; backward/forward is for Y values; turning the knob adjusts the Z values.
   b. Select [X], [Y], or [Z], enter a value using the DIRECT ENTRY keypad, and [ENTER].



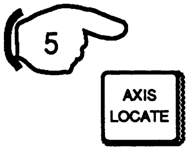
4. Press [ROT 3D] and rotate the picture using the Z axis of the joystick. If you wish to use the direct entry keypad, rotation values are entered as a percentage of a circle; the picture below shows some typical values. The rotation will take the shortest path to the number entered, so entries of ±.5 or less are recommended. Enter Z=0 to prepare for the next step.

Rotations are entered as:

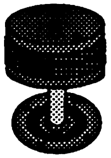
- **PERCENT** **(OF A CIRCLE)**



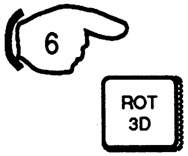
***NOTE:** Spins are used for most multiple turns in key frame effects. See "Spins" later in this lesson.*



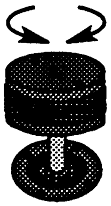
then



5. Select [AXIS LOCATE]. For this lesson, move the cursor to a position below and to the left of picture center, where X=-2, Y=-1, and Z=0.



then



6. Select [ROT 3D] . Use either the joystick or keypad to enter a value of Z=.25, as follows:
   a. Turn the joystick knob clockwise as the picture rotates 90° or 1/4 turn; or,
   b. Select [Z}, enter .25, and press [ENTER].

   With Z = .25, the picture will rotate clockwise around the Z axis at the center of rotation. The change is instantaneous when entered at the keypad. Select [AXIS LOCATE] and set X=0, Y=0, and Z=0.

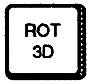
X Value Rotations

Rotations which change the X value will make the picture appear to rotate around the Y axis, as shown in the illustration titled "Rotating the DPM-700 Picture About the Y Axis" that follows. The picture will always appear in the correct perspective for 3D space.

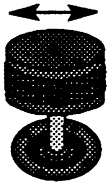
***NOTE:** In normal mode ([SOURCE] off), the picture will rotate relative to screen axes; the X axis will be horizontal and the Y axis will be vertical. If [SOURCE] is on, the picture will move relative to its own axes. For example, if the picture is Z-rotated 90° on the screen, its Y axis will be in a horizontal position while the screen's Y axis remains vertical.*

If the X value is greater than .25 (more than 90°), the picture will flip to its back side as it rotates. Typical rotation values will be between -.5 and .5.

NOTE: *If the center of rotation cursor is located off-screen or is placed in front of the screen plane, and/or if the radius of rotation is large, the picture may move off-screen for part of its rotation. In this case, only one side of the picture may be visible on the screen.*



then

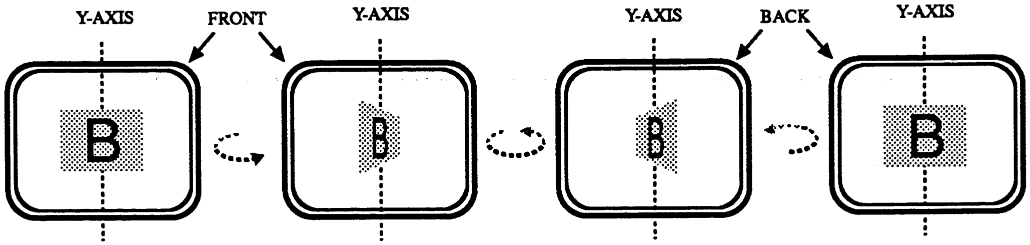


7. With [ROT 3D] selected and Z=0, press [X] and use the joystick or keypad to enter a value of X = .5, as follows:
   a. Move the joystick knob left/right to adjust the X value; or,
   b. Select [X], enter .5, and press [ENTER].

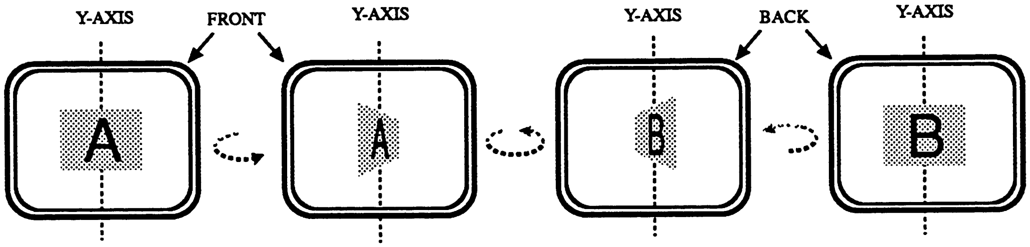
   With the value of X = .5 (180°) used in this lesson, the picture will flip completely to its opposite side. Try entering some intermediate values between ±.5 with the keypad. Set Z=0 to prepare for the next step.

X VALUE ROTATION

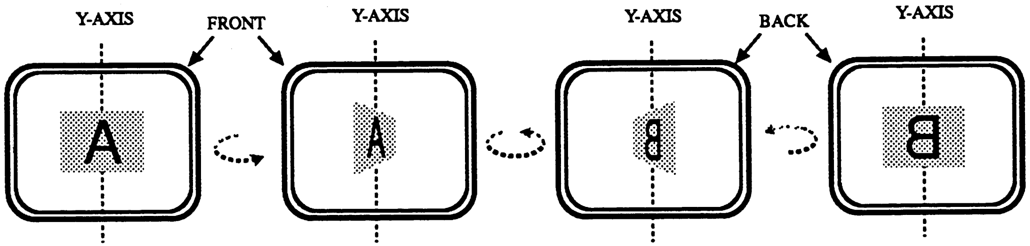
ROTATING A SINGLE INPUT PICTURE (NEAR AND FAR ARE IDENTICAL)


Y-AXIS
FRONT
Y-AXIS
Y-AXIS
BACK
Y-AXIS
B
B
B
B

ROTATING TWO DIFFERENT INPUT PICTURES (NEAR PICTURE IS DIFFERENT FROM FAR)


Y-AXIS
FRONT
Y-AXIS
Y-AXIS
BACK
Y-AXIS
A
A
B
B

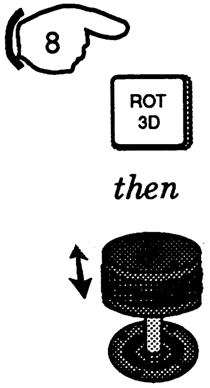
ROTATING AND REVERSING TWO DIFFERENT INPUT PICTURES (FAR IS REVERSED)


Y-AXIS
FRONT
Y-AXIS
Y-AXIS
BACK
Y-AXIS
A
A
B
B

Rotating the DPM-700 Picture Around the Y Axis: *You can use rotation to turn the picture about the Y axis. Each complete turn reveals both the front and back sides of the picture. The far side can be a different input than the near side. Either side can also be reversed horizontally or vertically.*

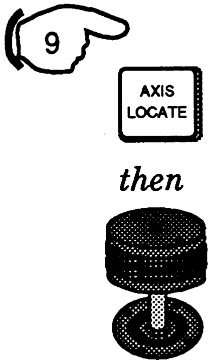
Y Value Rotations

Rotating a picture by changing the Y value will make the picture appear to rotate around the X axis, as shown in the "Rotating the DPM-700 Picture Around the X Axis" illustration on the next page. The picture will always appear in the correct perspective.

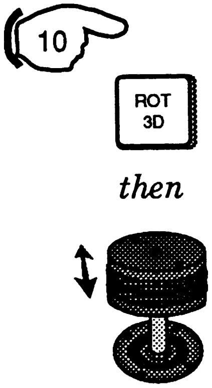


8. With [ROT 3D] selected, press [Y] and use the joystick or keypad to enter a value of Y = .5, as follows:
   a. Move the joystick knob forward/backward to adjust the Y value; or,
   b. Select [Y], enter .5, and press [ENTER].

   With the value of Y = .5 (180°) used in this lesson, the picture will flip completely to its opposite side. Try entering some intermediate values between ±.5 with the keypad.



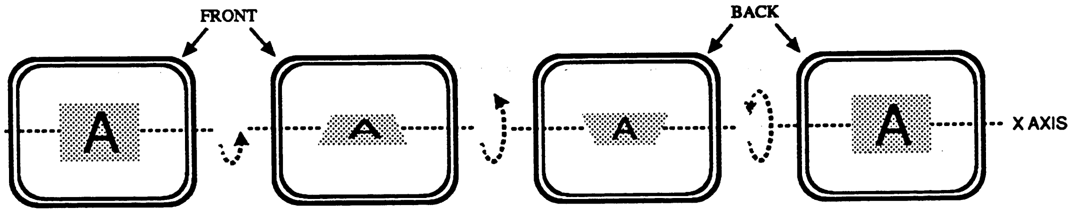
9. For the next operation, select [AXIS LOCATE] and move the center of rotation away from the center of the picture by entering values of X = 0, Y = 0, and Z = -5.



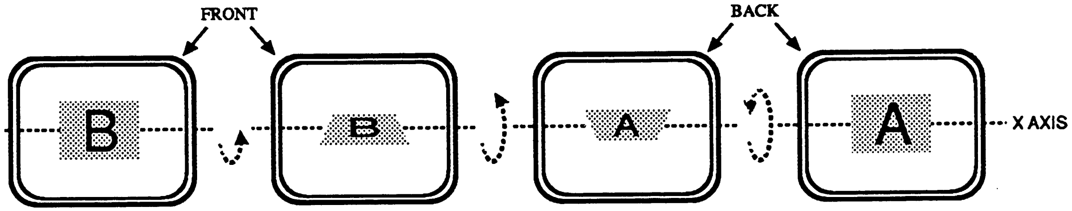
10. Select [ROT 3D], then move the joystick forward/backward to adjust the Y value. Now, when you rotate the picture, it will appear to move around this new center point. This produces an orbiting effect, as shown in the picture at the beginning of this lesson.

Y VALUE ROTATION

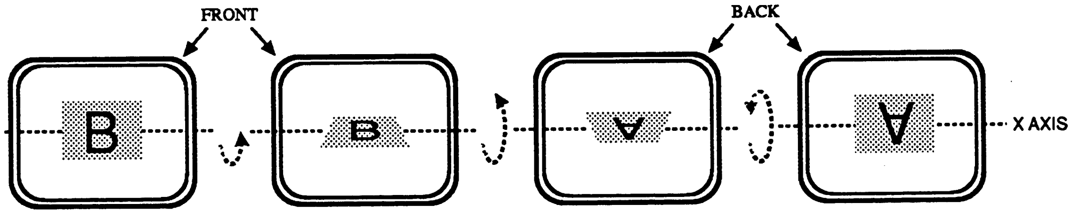
ROTATING A SINGLE INPUT PICTURE (NEAR AND FAR ARE IDENTICAL)


FRONT
BACK
A
A
A
A
X AXIS

ROTATING TWO DIFFERENT INPUT PICTURES (NEAR PICTURE IS DIFFERENT FROM FAR)


FRONT
BACK
B
B
A
A
X AXIS

ROTATING AND REVERSING TWO DIFFERENT INPUT PICTURES (FAR IS REVERSED)


FRONT
BACK
B
B
A
A
X AXIS

Rotating the DPM-700 Picture Around the X Axis: *You can use rotation to turn the picture about the X axis. Each complete turn reveals both the front and back sides of the picture. The far side can be a different input than the near side. Either side can also be reversed.*

***NOTE:** If you want to move the picture and the center of rotation cursor together and maintain their original spatial relationship, select* [AXIS LOCK] *in the TRANSFORM section before you perform a* [LOCATE 3D] *operation. Press* [AXIS LOCK] *again to turn it off.*

Spins

Remember that with [ROT 3D] selected the change from one keyframe to the next is restricted to 180°, or entries of ±.5. If you enter a keyframe, then rotate the picture through more than 180°, and then enter another keyframe, when you run the effect the rotation between those keyframes will not repeat what you did with the joystick. Instead, the change will take the shortest path. In other words, a joystick change of .75 will produce a path change of -.25 when the effect is run.

It is possible to create a multiple rotation effect using the [ROT 3D] function. To do so, insert several keyframes with less than 180° of rotation between each one.

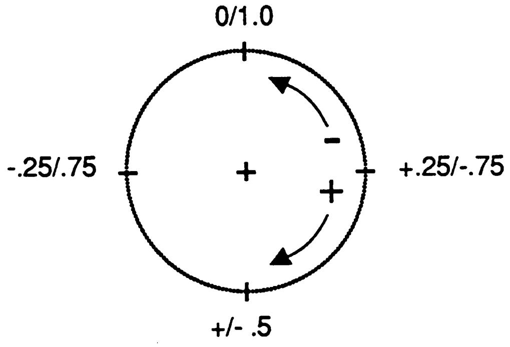
The [SPIN] function is used to perform multiple turns about an axis using only two keyframes in the keyframe effect. As mentioned earlier, the *spin* path is only slightly irregular in some effects when compared to a *rotate* path.

Spins are performed in the same way as *rotations*. Refer to the preceding tutorial to experiment with spins, selecting [SPIN] wherever [ROT 3D] is shown.

For keypad entry of multiple-turn spins, enter whole circle, decimal point, and percentage of a circle, as shown in the illustration below.

Spins are entered as:

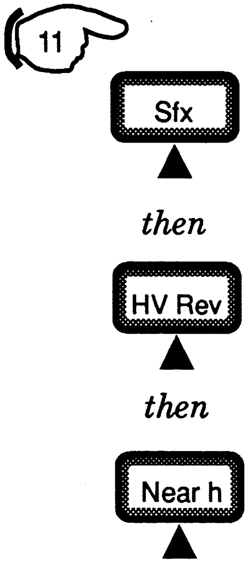
WHOLE CIRCLE • PERCENTAGE OF A CIRCLE



Reversing a Picture

One useful effect you can apply to both the near and far sides of an input picture is to reverse the image, as follows:

- Images reversed horizontally will appear as mirror-images of the original input picture.
- Images reversed vertically will appear upside-down.



11. Select {Sfx} from the STREAMLINE™ top level menu by pressing the pushbutton underneath the word "Sfx." Next, select {HV Rev}. A menu will appear which allows you to turn on or off the reverse function for the following directions:
    - {Near h}: near side, horizontal.
    - {Near v}: near side, vertical.
    - {Far h}: far side, horizontal.
    - {Far v}: far side, vertical.

    For this lesson, press {Near h} until the word appears in all capital letters in the display.

    Press the pushbutton once to turn the function on and again to turn it off.

***NOTE:** Inputs assigned to the far side will not be visible until that side of the picture is facing the screen.*

LESSON 2-5: OPERATING IN SOURCE MODE

The DPM-700 lets you select either target or source mode for some transforms.

- In target mode, transforms take place in reference to the video screen itself—the "target"—as shown in the picture on the next page.

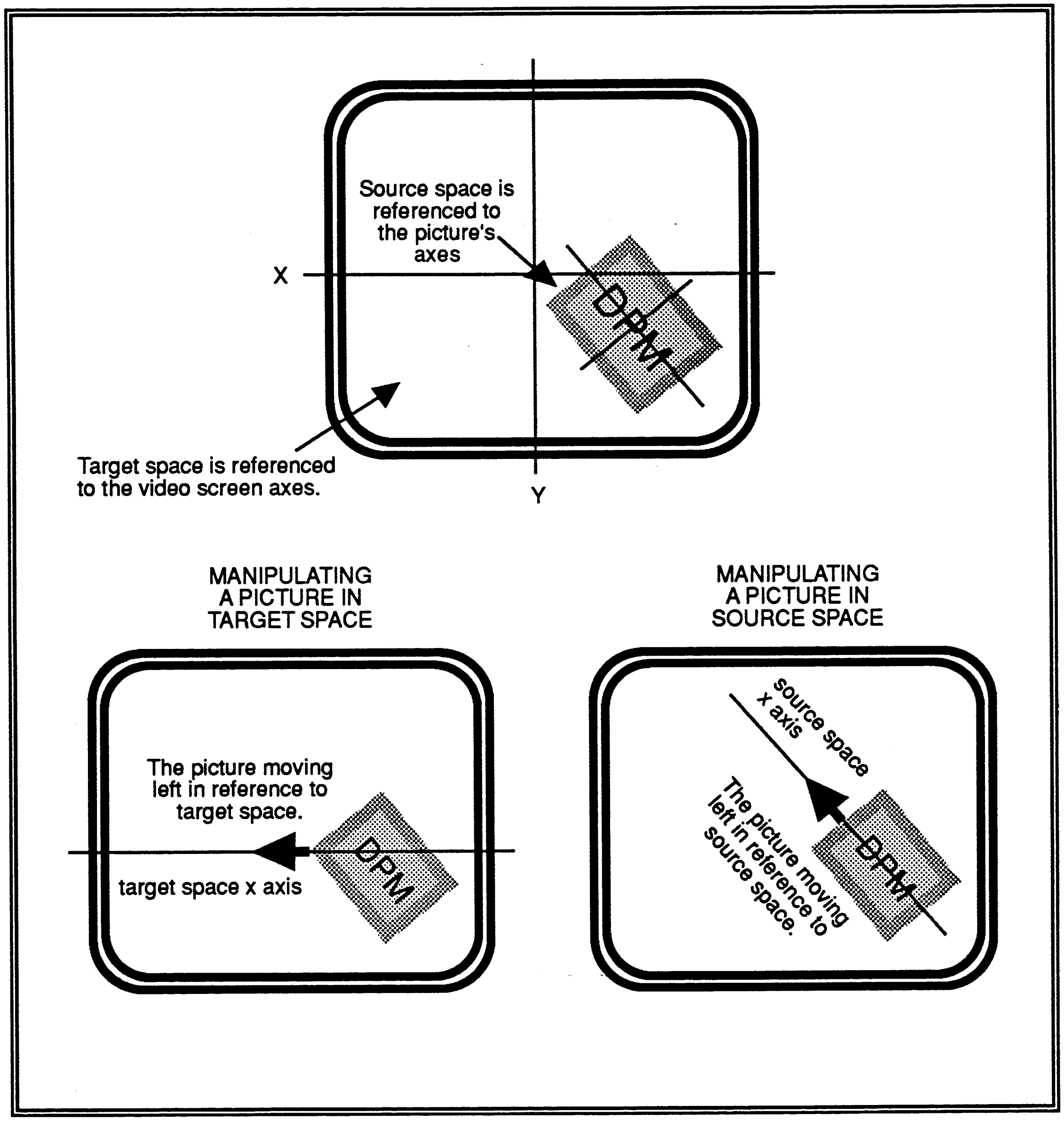
- In source mode, operations such as location and rotation take place in reference to the picture itself—the "source."

To select source mode instead, select the [SOURCE] pushbutton in the TRANFSORM section; the pushbutton will light to show that it is selected. Press [SOURCE] a second time to turn off source mode.

In order to keep track of the picture's orientation in source mode, the status menu (Page 2-17) indicates both the front and back of the picture, and the near and far sides. It is important to know whether the front or back is visible when moving in *source space*.

When the front side is visible to the viewer, and a move to the left is made with the joystick, the picture moves to the viewer's left. When the front side is away from the viewer, and a move to the left is made, the picture moves to the viewer's right. So the direction of a source-space move is always determined by whether the front of the picture is on the near side or the far side.

The same principle applies when the picture is rotated around the x axis, and up or down moves are made. An *up* input can have a *down* result.


Source space is referenced to the picture's axes
X
Y
DPM
Target space is referenced to the video screen axes.
MANIPULATING A PICTURE IN TARGET SPACE
The picture moving left in reference to target space.
target space x axis
DPM
MANIPULATING A PICTURE IN SOURCE SPACE
source space x axis
The picture moving left in reference to source space.
DPM

Source Space: *Many DPM-700 manipulations can be performed using source space instead of target space. That is, the picture will be manipulated according to its own reference space—its left and right sides, top, and bottom—instead of the left, right, top, and bottom of the video monitor.*

Moving In Source and Target Space With Global Transforms

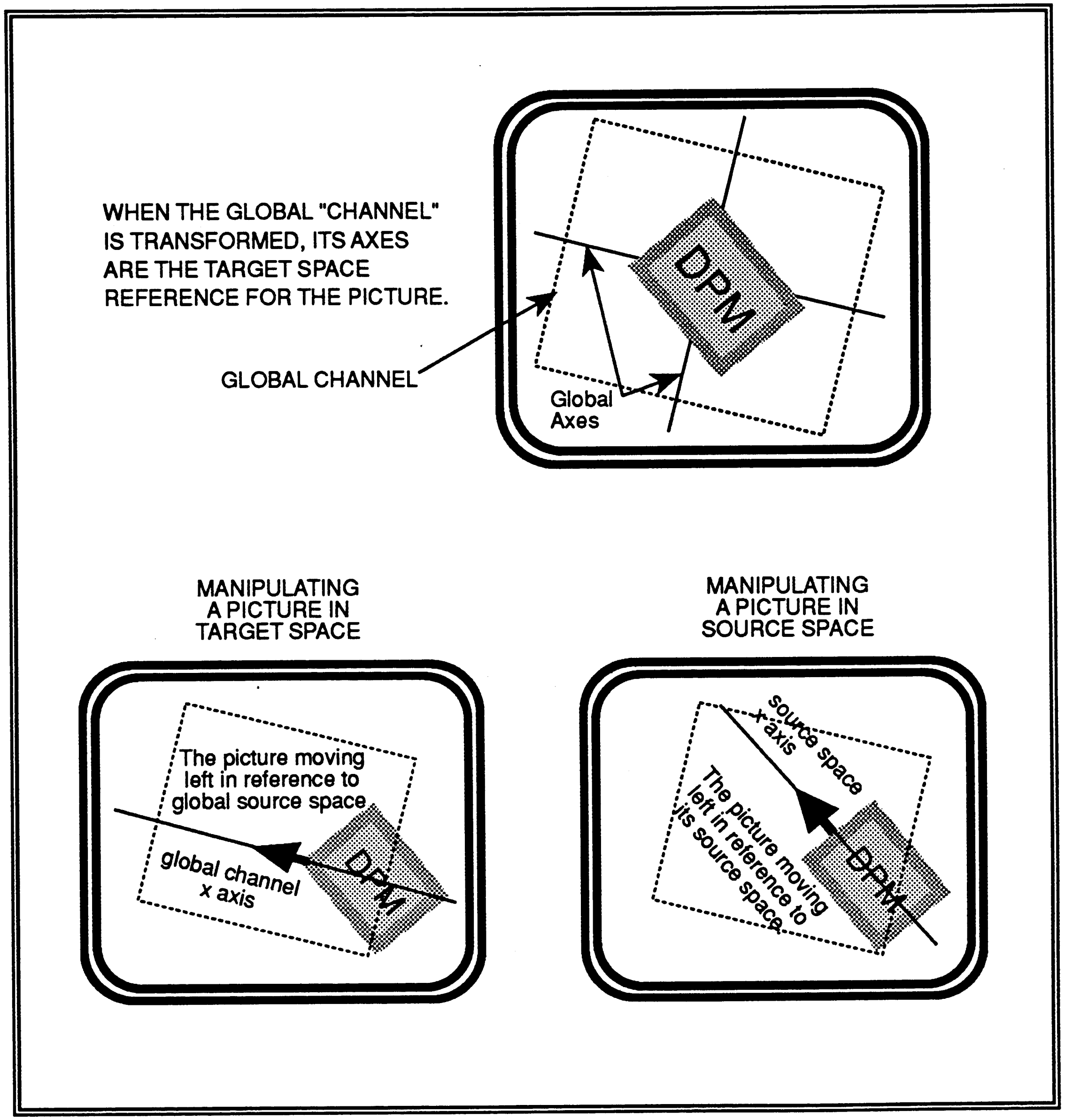
There is a [GLOBAL] selection in the DELEGATION section of the DPM-700 control panel along with the [CH1] and [CH2] selections. This third selection allows you to delegate the control panel inputs to a global "channel", which has no video of its own but contains the channel 1 and channel 2 pictures. For details on global channel operations, refer to "USING THE GLOBAL CHANNEL AND TRANSFORMS" later in this section.

When the global channel is at unity size and zero location, rotation, etc., in all three axes (factory default), channel 1 and channel 2 operations in target space are the same as described on the previous pages. When the global channel is transformed in one or more axes, channel 1 and channel 2 are affected accordingly. Target space operations will be relative to the global channel's axes rather than the video screen's axes. This is illustrated on the next page.

Channel 1 and channel 2 source space moves will always be in reference to the axes of their pictures.

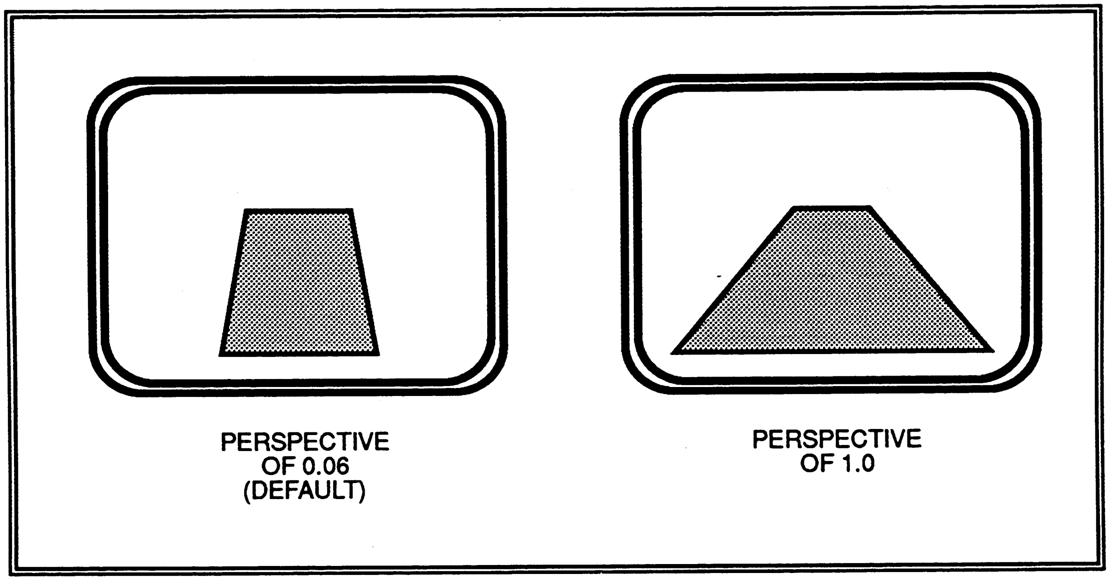
Global channel moves in target space are always in reference to the video screen's axes.

Global channel moves in source space are always in reference to the global channel's axes.


WHEN THE GLOBAL "CHANNEL" IS TRANSFORMED, ITS AXES ARE THE TARGET SPACE REFERENCE FOR THE PICTURE.
GLOBAL CHANNEL
Global Axes
DPM
MANIPULATING A PICTURE IN TARGET SPACE
The picture moving left in reference to global source space
global channel x axis
DPM
MANIPULATING A PICTURE IN SOURCE SPACE
source space x axis
The picture moving left in reference to its source space
DPM

Global Target and Source Space: *When the global channel is not transformed, moves in target space are in reference to the axes of the video screen (i.e. The video screen and global channel axes are the same). When the global channel is transformed, moves in target space are in reference to the global channel's transformed axes.*

LESSON 2-6:
ADJUSTING THE PERSPECTIVE OF A PICTURE



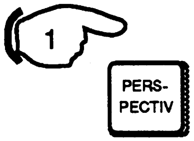
Perspective: *You can adjust the apparent relative position of the viewer to the picture. As distance between the view and picture decreases, perspective becomes more apparent.*

The perspective function controls the amount of visible perspective on a picture. For example, in the illustration above, the picture represents a square in which the top edge has been tilted back so that it is farther from the viewer than the bottom edge. Perspective makes the top edge appear narrow than the bottom edge.

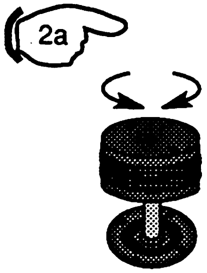
The amount of visible difference will vary depending on how far the picture is from the viewer.

- A perspective setting of 0.0 (picture at infinity) would show no perspective because the amount of picture tilt would be insignificant compared to the viewing distance.
- A setting of 2 (picture very close to the viewer) would show extreme perspective.

NOTE: Perspective will be visible only when one part of the picture is farther from the screen than another, and not when the picture is flat (parallel) to the screen. Use X or Y rotation / spin before applying perspective in order to see the effect.

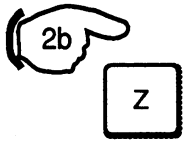


1. Select [PERSPECTIV] in the TRANSFORM section of the control panel. You can use the joystick, the STREAMLINE™ soft knob, or the DIRECT ENTRY keypad to adjust the amount of perspective.

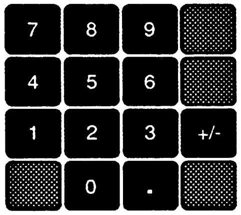


2. The Z value for perspective controls the overall amount of perspective visible in the picture.

Note: Higher values of perspective will cause the picture to "wrap around" the viewer and appear to fold back on itself on the opposite side of the screen. To prevent this you can enable {PClip} in the {Misc} menu of the STREAMLINE display.



then

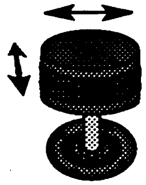


then

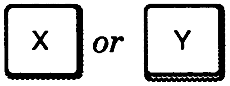
   a. Turn the joystick knob to adjust the Z value. Turning the knob clockwise increases perspective.
   b. Select [Z] in the DIRECT ENTRY section. Use the keypad to enter a perspective value and then press [ENTER].

3. The X and Y perpective values control the location of the vanishing point.
   a. Move the joystick knob left or right to adjust the X perspective value; move it forward or backward to adjust the Y perspective value (you can also use the soft knob if [X] or [Y] is selected in the DIRECT ENTRY section of the panel).
   b. With [X] or [Y] selected, use the keypad to enter a value between 0 and 100; press [ENTER].

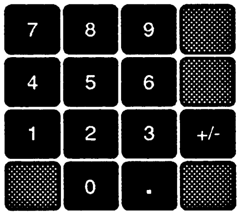
3a



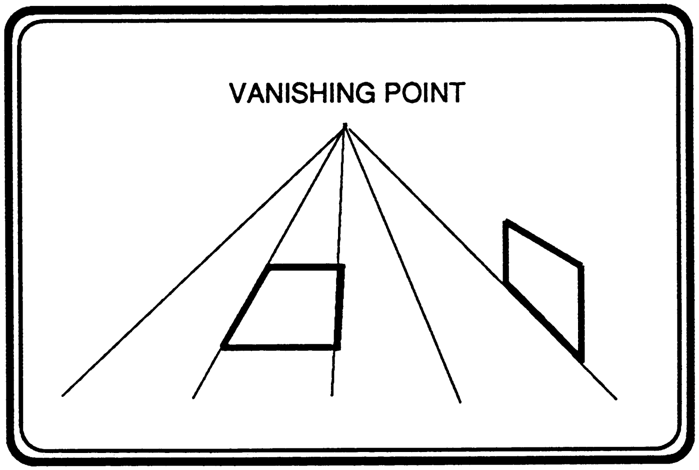
3b



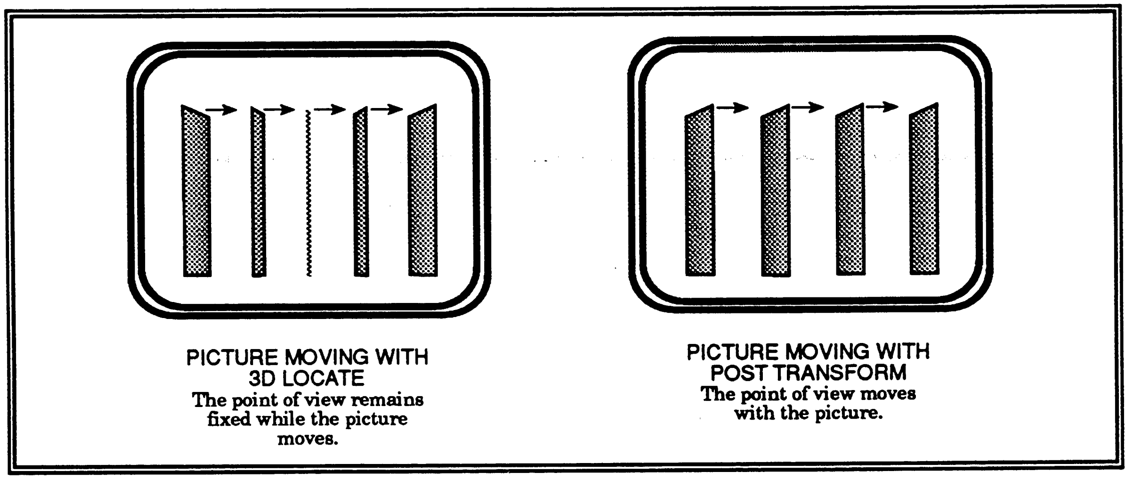
then



then



LESSON 2-7:
USING POST TRANSFORM TO MAINTAIN A FIXED POINT OF VIEW

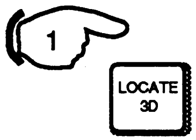

PICTURE MOVING WITH 3D LOCATE
The point of view remains fixed while the picture moves.
PICTURE MOVING WITH POST TRANSFORM
The point of view moves with the picture.

Post Transform: *When [POST XFORM] is used, it "locks" the viewer's point of view to the picture during size and location operations; this lets you control the angle of viewing.*

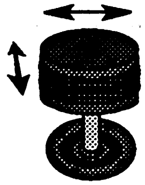
Post Transform is a special transform function which only affects size and location operations. It allows you to fix or "lock" the angle at which the viewer sees the picture so that it will remain the same even when the picture's size or location changes. The picture can look very different depending on whether the post transform function is used, as shown in the illustration above.

As an example, if you are standing still and a cat walks in front of you from left to right, you will see the cat's head as it approaches and its tail as it leaves; the picture appears to change depending on your point of view. This relative point of view is the DPM-700's normal mode of operation and is shown in the left monitor screen above.

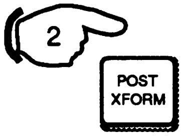
In contrast, if you are walking on a parallel line with the cat and at the same speed, it will appear the same to you no matter where it is along its path because your point of view remains the same. This is what post transform does, as shown in the right monitor on the previous page. It fixes the point of view and moves it along with the picture.



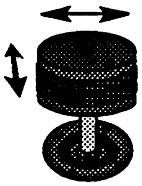
then



1. With Source Mode off, select [LOCATE 3D] and [X]. Use the joystick to move the picture left and right across the screen and observe how the angle of view changes as the picture moves.

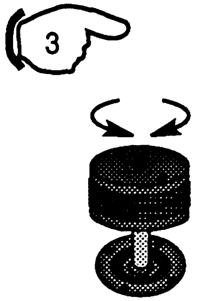


then



2. Select [POST XFORM] in the TRANSFORM section of the control panel. Again, use the joystick to move the picture left and right; notice that the angle at which you view the picture remains the same as the picture moves.

NOTE: *When post transform mode is used, the center of rotation cursor will move with the picture.*

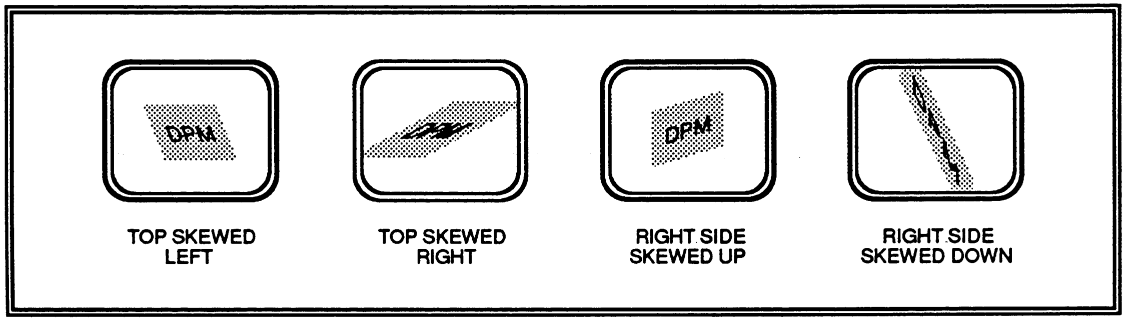


3. Compare [LOC 3D] and [SIZE] to [POST XFORM] using Z value entries. Notice the difference in appearance as the picture becomes larger or smaller in [POST XFORM] without the three dimensional qualities of the other two transforms.

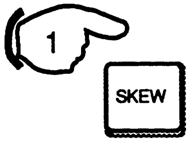
Post Transform moves the vanishing point and the picture at the same time. If you do a 3D transform after doing a Post Transform, the angle of view remains as it was in Post Transform.

NOTE: *All Post Transforms occur relative to the screen axes, or global target space.*

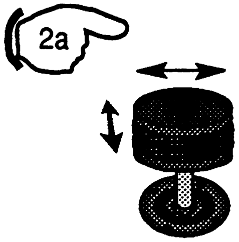
LESSON 2-8:
SKEWING (SLANTING) A PICTURE



Skewing the Picture: *Moving the joystick left / right or forward / backward adjusts the shape of the picture as if you were stretching the top and bottom in opposite directions or pulling the right and left sides in opposite directions.*

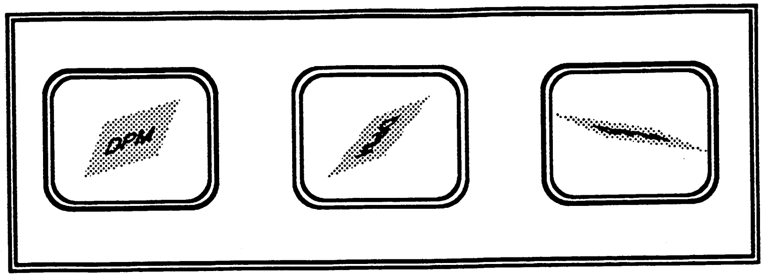


1. Select [SKEW]. You can use the skew function to transform the DPM picture by changing its angle of slant along the horizontal (X) and/or vertical (Y) axes. There is no Z axis adjustment for skew.

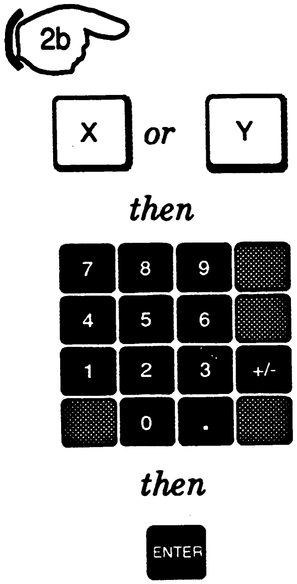


2. There are three ways to skew the picture.
   a. Move the joystick knob in the direction you want to move the top or the right side of the picture.
      - Left/right adjusts the X-axis value and moves the top of the picture left or right; the bottom of the picture moves in the opposite direction.
      - Forward/backward controls the Y-axis value and moves the right side of the picture up or down; the left side of the picture moves in the opposite direction.

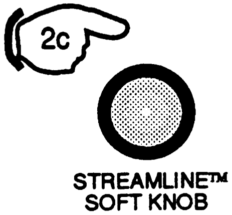
   In either case, the center of the picture will stay in the same place.



Skewing: *You can adjust the skew of the picture both left / right and up / down to produce complex shapes.*



b. Select [X] or [Y], enter a value using the DIRECT ENTRY keypad, and press ENTER.
   - Positive X values move the top of the picture to the right;
   - Negative X values move the top of the picture to the left;
   - Positive Y values move the right side up;
   - Negative Y values move the right side down.



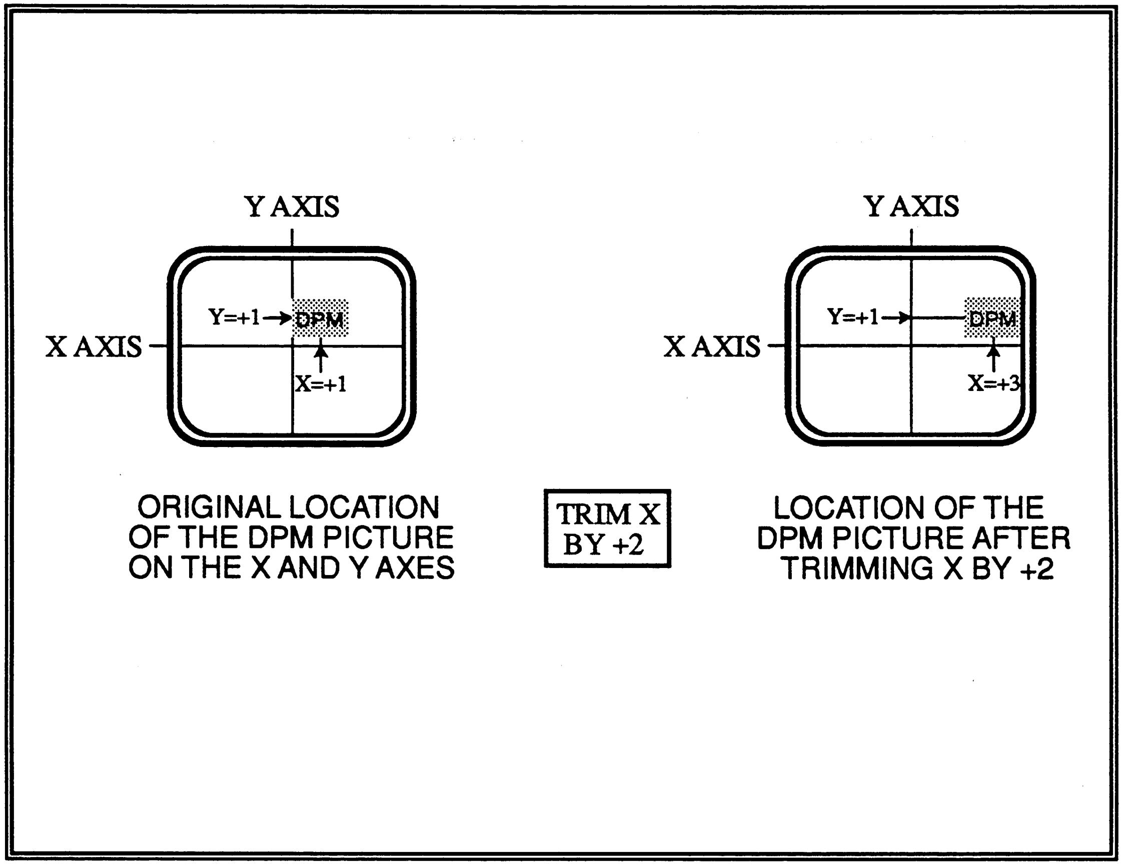
c) With [X] or [Y] selected, turn the soft knob to adjust the skew value. The value will appear in the DIRECT ENTRY display.

Note that when skew values are very large, the picture will become a vertical or horizontal line and will eventually disappear entirely from the screen.

NOTE: *You can use skewing to italicize letters and numbers.*

LESSON 2-9:

TRIMMING X, Y, AND Z VALUES

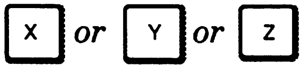

Y AXIS
X AXIS
Y=+1
DPM
X=+1
ORIGINAL LOCATION OF THE DPM PICTURE ON THE X AND Y AXES
TRIM X BY +2
Y AXIS
X AXIS
Y=+1
DPM
X=+3
LOCATION OF THE DPM PICTURE AFTER TRIMMING X BY +2

Adding to an Existing X, Y, or Z Value: *You can use the DIRECT ENTRY keypad trim function to add or subtract a specific amount from the current X, Y, and/or Z value of any transform. In this picture, the X axis value for the location transform is being trimmed.*

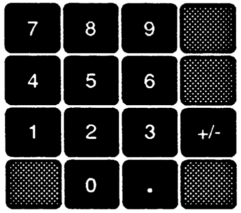
Select a transform function.

1. Select the transform you want to adjust: picture location, size, aspect, rotation, spin, or skew.

2



then



then

2. Select [X], [Y], or [Z]. The current value will show in the DIRECT ENTRY display.

- Key in the desired value, either positive or negative. **DO NOT PRESS [ENTER].** Remember that this value is to be added to the current value; it will not replace it.

- **Press [TRIM]** on the DIRECT ENTRY keypad.

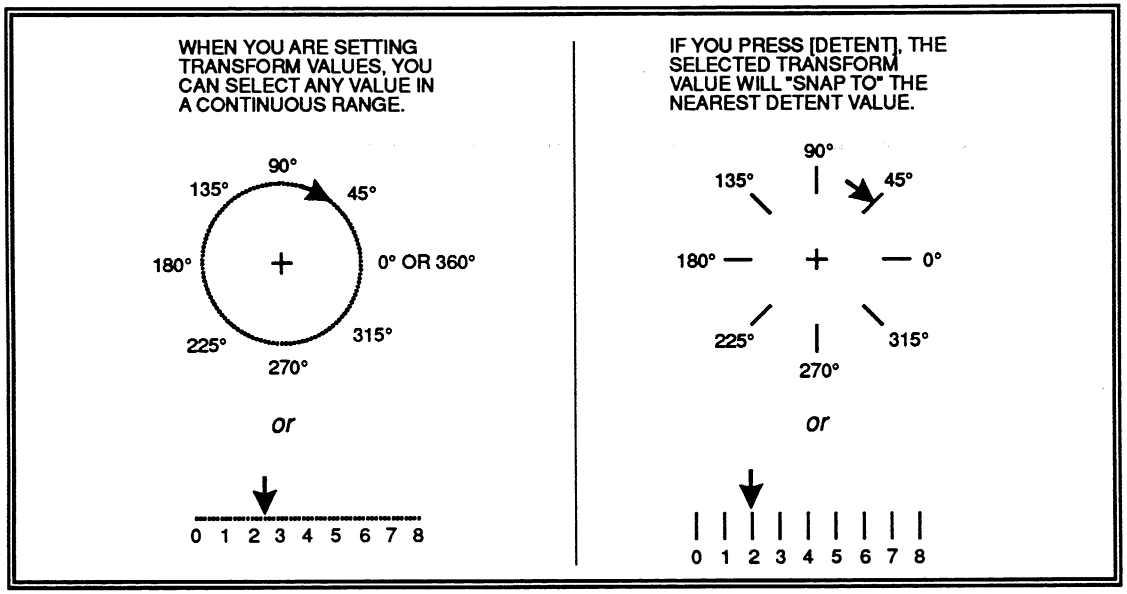
  The previous value plus the trim value will now be displayed in the DIRECT ENTRY display, indication the new position of the picture.

Trimming in General

The [TRIM] function provides a relative change, rather than an absolute change, for any parameter that can be set with the DIRECT ENTRY keypad.

If a trim value is entered and [TRIM] is pressed repeatedly, the value will be added repeatedly.

LESSON 2-10: DETENT VALUES


WHEN YOU ARE SETTING TRANSFORM VALUES, YOU CAN SELECT ANY VALUE IN A CONTINUOUS RANGE.

IF YOU PRESS [DETENT], THE SELECTED TRANSFORM VALUE WILL "SNAP TO" THE NEAREST DETENT VALUE.

Limiting Data Entry to Predetermined Values: *You can use the detent function to quickly move to the nearest detent value.*

1 *Select a transform function.*

2

X *or* Y *or* Z

then

DETENT

1. Select the transform you want to adjust: picture location, size/aspect, rotation, spin, or skew.

2. Select [X], [Y], or [Z]. Then press [DETENT] on the DIRECT ENTRZY keypad. The selected X, Y, or Z value will be changed to the nearest detent value. For example, if you selected [LOCATE 3D] and [Z], and if Z = .51 (as shown in the DIRECT ENTRY display), pressing [DETENT] would automatically change it to Z = .50, the nearest detent value for Z location.

LESSON 2-11: CREATING A KEY FRAME EFFECT

If you have never worked with key frame effects before, the next three pages will provide you with an overview of what they are and how you can use them. effectively.

A key frame is a set of picture characteristics or **parameters** which define the picture at an instant in time. The parameters include size, location, shape, background, borders, and picture source (such as Input A of the DPM-700), but do *not* include video data for the picture. That is, a key frame defines a picture's parameters, but the picture itself will be whatever video source is on the selected input.

Single key frames can be linked to other key frames so that you can run them in sequence, automatically. A key frame sequence is called an **effect** or **key frame effect**. Using the DPM-700, you can create a key frame effect of up to 150 different key frames.

The way in which the parameters change between one key frame and the next is computed by the DPM-700 according to the way you have programmed the effect; for example, a change in location could be along a linear path or a curved path. The time it takes for one key frame to change to the next is called the **key frame duration**; it is set at a default rate of one second.

In this lesson, you will create a simple key frame effect. In following lessons, you will learn how to run, review, edit, save, and recall key frame effects.

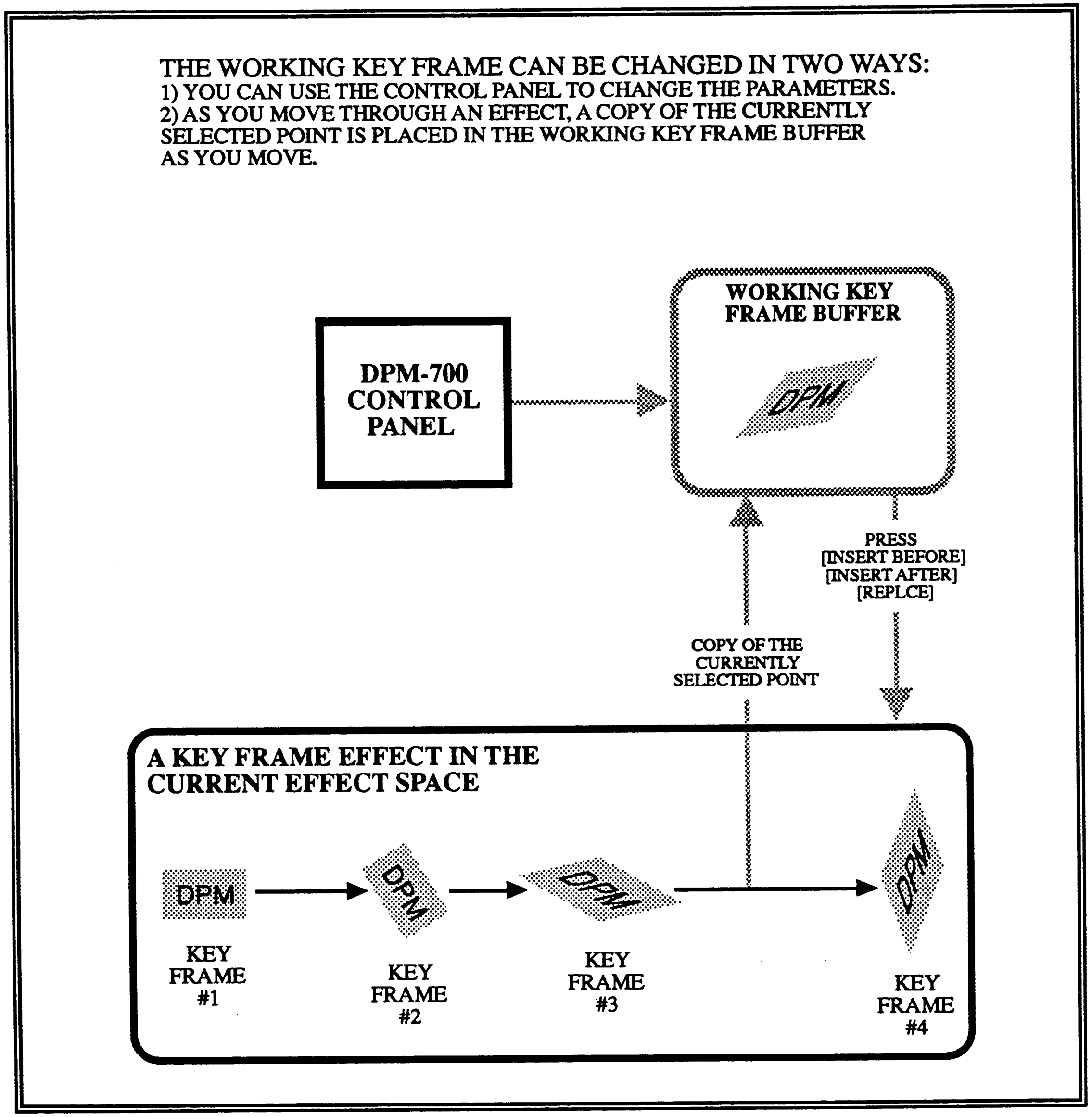
The general procedure for creating a key frame effect is to first use the control panel to set up a key frame in the **working key frame buffer**.

When you have completed each setup, you will insert the key frame into the **current effect space**, which is your temporary storage buffer for the key frame effects you create.

For more permanent storage, you can save your effects into E-MEM® Effects Memory registers. You can store these E-MEM® registers onto disks for off-line storage or for transfer to another DPM-700.

NOTE: *You will need to make sure the current effect space is empty before you create your new effect. To do this, recall E-MEM® register #00, which is always empty, as follows:*

1. *In the E-MEM® section, select [RECALL TO CUR EF]; the pushbutton will light.*
2. *Select all three [RECALL] pushbuttons; they will light when selected.*
3. *Press [BANK], then [0][0] to recall register #00.*

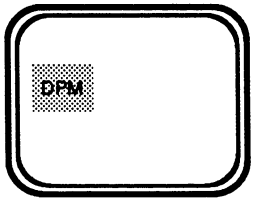

THE WORKING KEY FRAME CAN BE CHANGED IN TWO WAYS:
1) YOU CAN USE THE CONTROL PANEL TO CHANGE THE PARAMETERS.
2) AS YOU MOVE THROUGH AN EFFECT, A COPY OF THE CURRENTLY SELECTED POINT IS PLACED IN THE WORKING KEY FRAME BUFFER AS YOU MOVE.
DPM-700 CONTROL PANEL
WORKING KEY FRAME BUFFER
DPM
PRESS [INSERT BEFORE] [INSERT AFTER] [REPLCE]
COPY OF THE CURRENTLY SELECTED POINT
A KEY FRAME EFFECT IN THE CURRENT EFFECT SPACE
DPM
KEY FRAME #1
DPM
KEY FRAME #2
DPM
KEY FRAME #3
DPM
KEY FRAME #4

Key Frame Current Effect Space and Working Key Frame Buffer: *All key frame setups and editing changes take place in the working key frame buffer. The working key frame is then inserted into the current effect space using the [INSERT BEFORE], [INSERT AFTER], and/or [REPLCE] pushbuttons.*

1

Use the control panel to set up a key frame.

NOTE: For this part of the tutorial, select [CH 1] in the DELEGATION section of the panel. You will learn how to work with multiple channel key frames (Channel 1 and/or Channel 2 and/or Global) in later lessons.

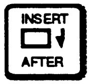


KEY FRAME #1

1. Use the control panel to set up the effect you want as your first key frame; this is your working key frame. You can use any of the transforms you have already learned: location, size, etc.

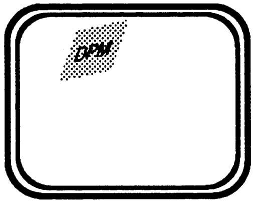
   For this tutorial, set up a key frame similar to the one shown in the left column for Step 1. Use [SIZE] and [LOCATE 3D].

2



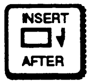
2. Press [INSERT AFTER] in the KEYFRAME section (it will be lighted) to save your setup into the current effect space as Key Frame #1. The number "1" will appear in the KEY FRAME display to show that Key Frame #1 has been entered into the current effect space.

3a



KEY FRAME #2

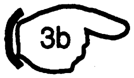
then

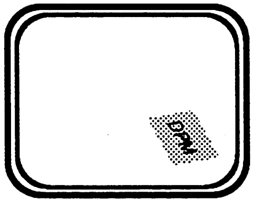


3. Next you will repeat the process for as many key frames as you want in the effect.

   a. For Key Frame #2, change the picture in the working key frame buffer by skewing and relocating it, as shown in the left column. (Use [SKEW] and [LOCATE 3D].)

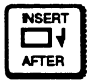
      Press [INSERT AFTER]. This will insert the working key frame into the current effect space as Key Frame #2.



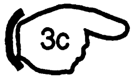


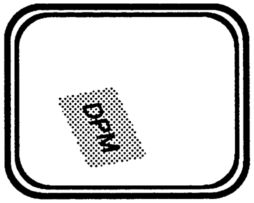
KEY FRAME #3

then



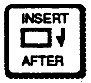
b. For Key Frame #3, change the working key frame by spinning the picture clockwise and relocating it, as shown in the left column. (Use [SPIN] and [LOCATE 3D].) Press [INSERT AFTER] to insert the working key frame into the current effect space.



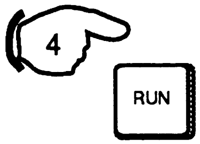


KEY FRAME #4

then



c. For Key Frame #4, change the working key frame by making the picture larger and relocating it. (Use [LOCATE 3D] and [SIZE].) Press [INSERT AFTER].



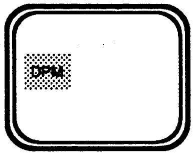
4. To see the key frame effect you have created, go to the TRANSITION EFFECT section and press [RUN]. The entire effect will run automatically, beginning with the first key frame.

   Notice that the spin effect you programmed into Key Frame #3 affects the motion path of the entire key frame effect. That is, there is some spinning between Key Frames #1 and #2, and between #3 and #4. This is because the DPM-700 uses a "smooth" path function as its default to shape the motion path; the smooth function averages the effects over the entire motion path. You will learn how to select different path functions in following lessons.

NOTE: *We recommend that you use this key frame effect for the following lessons in the tutorial so that what you see on your monitor will match the illustrations. If you need to interrupt the tutorial at any point, you can store this effect in an E-MEM® EFFECTS MEMORY register to recall later. See the next lesson for details about E-MEM® operations.*

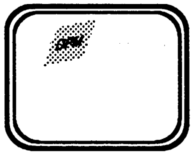
Creating A Key Frame Effect

KEY FRAME #1:
SET UP THE EFFECT YOU WANT AS YOUR FIRST KEY FRAME.



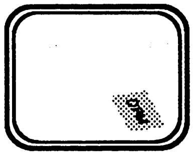
Press [INSERT AFTER].

KEY FRAME #2:
CHANGE THE ORIGINAL PICTURE (KEY FRAME #1) BY SKEWING AND REPOSITIONING IT.



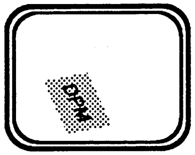
Press [INSERT AFTER].

KEY FRAME #3:
CHANGE THE #2 PICTURE BY SPINNING IT CLOCKWISE AND REPOSITIONING IT.



Press [INSERT AFTER].

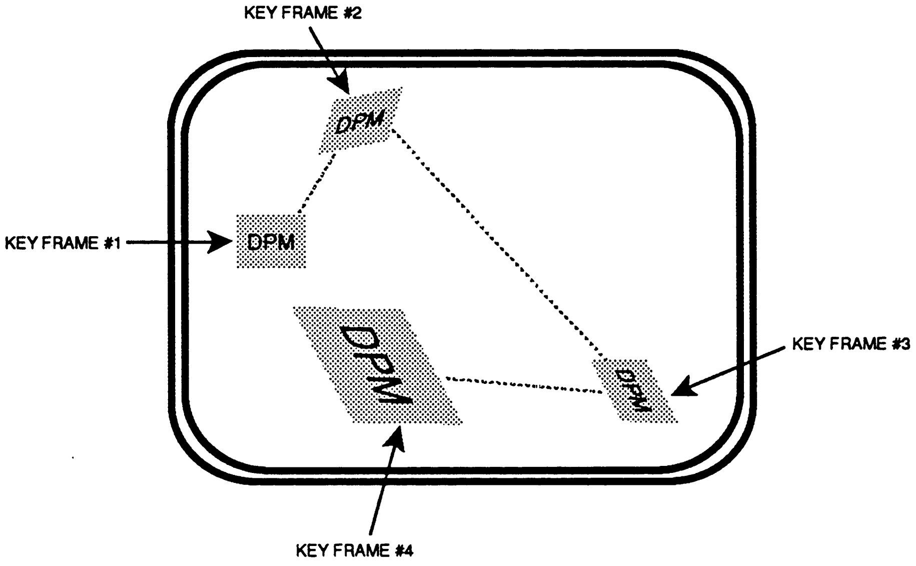
KEY FRAME #4:
CHANGE THE #3 PICTURE BY MAKING IT LARGER AND REPOSITIONING IT.



Press [INSERT AFTER].

Running the Key Frame Effect

Press [REWIND], then [RUN].

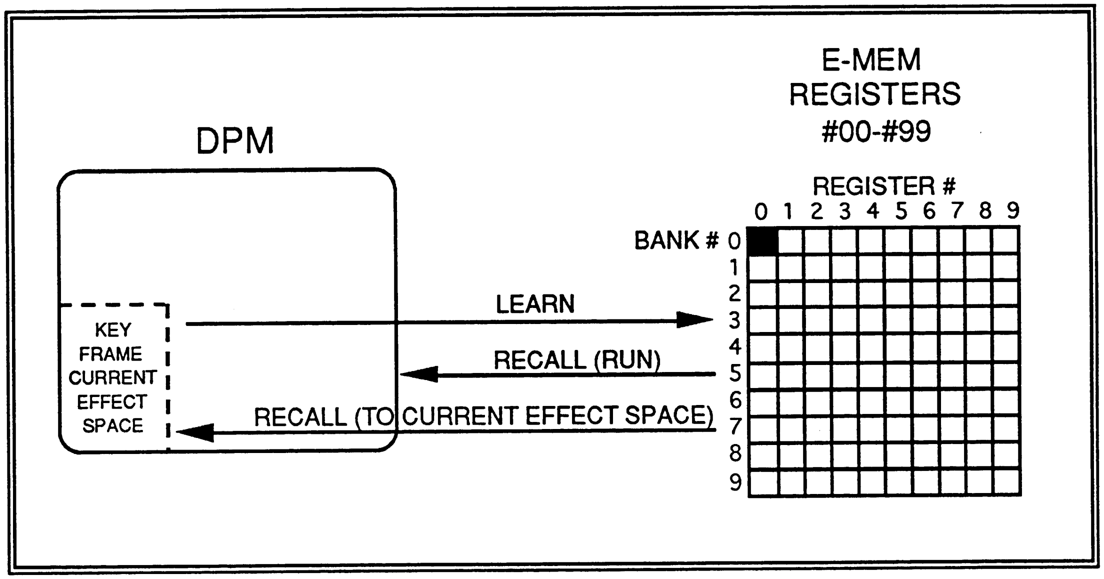

KEY FRAME #2
DPM
KEY FRAME #1
DPM
DPM
DPM
KEY FRAME #3
KEY FRAME #4

Running the Key Frame Effect: *After you create your key frame effect one key frame at a time, you can run it automatically by pressing [REWIND] and [RUN].*

LESSON 2-12: LEARNING (SAVING) AND RECALLING EFFECTS USING E-MEM® REGISTERS

Once you have created a key frame effect, you can save it into an E-MEM® Effects Memory register. A save operation (called a "learn") memorizes an entire key frame effect, including all transformations and motion programming, and saves it for future recall. The data is saved even if power to the system is turned off.

NOTE: *A learn operation memorizes which input is selected for the effect but does not memorize the actual picture data. To synchronize an effect with a particular picture, you will need to use an editor to control the picture source and the DPM-700.*



DPM
E-MEM REGISTERS #00-#99
REGISTER #
0 1 2 3 4 5 6 7 8 9
BANK # 0 1 2 3 4 5 6 7 8 9
KEY FRAME CURRENT EFFECT SPACE
LEARN
RECALL (RUN)
RECALL (TO CURRENT EFFECT SPACE)

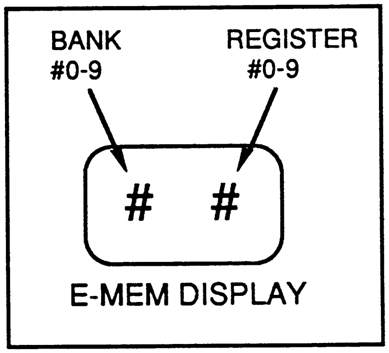
E-MEM® Effects Memory Operations: *Each of the 99 available E-MEM® memory registers can learn an entire key frame effect.*

There are 99 different E-MEM® registers (01-99) available for storage. Register #00 is not available for storage for each channel. This register is always empty so that you can recall it to automatically clear the key frame current effect space whenever you want to create a new key frame effect.

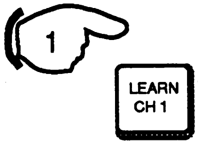
The registers are arranged in ten banks containing ten registers each.

The left digit in the E-MEM® display tells which bank you are currently using. The ten banks are numbered from 0 through 9.

The right digit shows the register number you have selected. The ten registers are also numbered from 0 through 9.

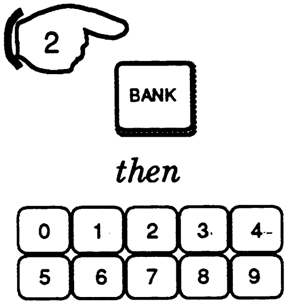


Learning an Effect



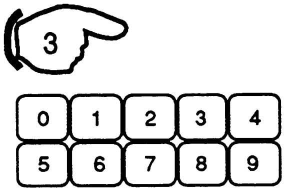
1. To learn the current effect into memory, first press one or more of the [LEARN] pushbuttons. For this tutorial, select [LEARN CH 1].

NOTE: When you learn an effect into an E-MEM® register, any data currently stored in that register on the selected channels—[LEARN CH 1], [LEARN CH 2], and/or [LEARN GLOBAL]*—will be erased.*



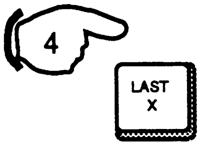
2. Select the bank you want to use for storage by pressing the [BANK] pushbutton and then pressing the desired bank number, 0-9.

NOTE: *Do not use E-MEM® register 00. This register is always empty so that you can recall it to clear the current effect space.*



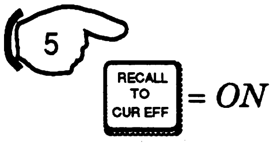
3. Perform the learn operation by pressing the number of the E-MEM® register you want to use for storage: 0-9. This number will appear as the right digit in the E-MEM® display. The effect will now be stored in that register.

Undoing a Learn: As mentioned above, when you perform a learn, any data which was previously stored in the register you use will be erased. However, this data is temporarily stored in a special buffer, and you can undo the learn as long as you have not performed another learn or a [RECALL TO CUR EFF] operation since the original learn.



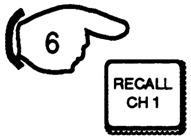
4. Press [LAST X]. The data which was erased will be returned to the register, just as it was before you performed the learn.

Recalling a Learned Effect To the Current Effect Space

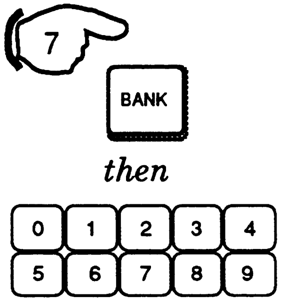


5. To recall the effect from E-MEM® storage back to the current effect space, select [RECALL TO CUR EFF]. The pushbutton will light.

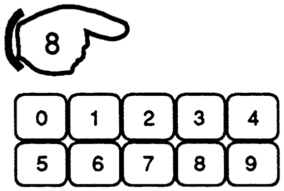
NOTE: *When you recall an effect into the current effect space, any data which was stored in that space will be erased. (The data can be recovered by performing a Last X, as described on the following page.)*



6. Select one or more of the [RECALL] pushbuttons. For this tutorial, select [RECALL CH 1].



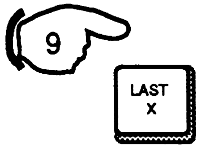
7. Select the bank you used for storage by pressing [BANK] and then the number of the bank.



8. Perform the recall operation by pressing the number of the register the effect is stored in. This number will appear as the right digit in the E-MEM® display.

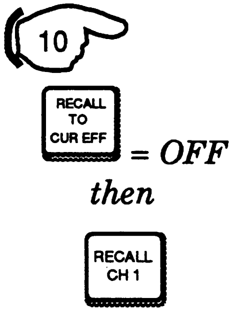
   The key frame effect stored in the selected register will be placed into the current effect space, where you can review and/or edit it. The effect also remains in the E-MEM® register; it is not erased when it is recalled.

Undoing a Recall To the Current Effect Space: As mentioned earlier, when you perform a recall to the current effect space, any data which was stored in the space will be erased. However, this data is temporarily stored in another buffer, and you can undo the recall as long as you have not performed another [RECALL TO CUR EFF] operation or a learn since the original recall.

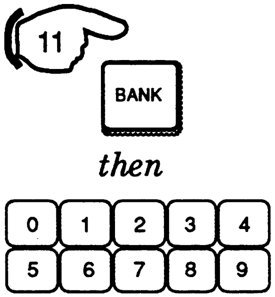


9. Press [LAST X]. The data which was erased during the recall will be returned to the current effect space, just as it was before you performed the recall.

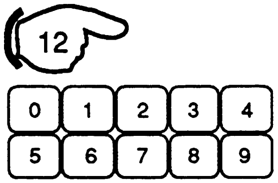
Running a Learned Effect



10. To run a key frame effect which is stored in an E-MEM® register *without* recalling it into the current effect space, first make sure that the [RECALL TO CUR EFF] pushbutton is off (not lighted). Then select one or more of the [RECALL] pushbuttons. For this tutorial, select [RECALL CH 1].



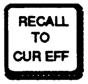
11. Select the bank the effect is learned in by pressing the [BANK] pushbutton and then the number of the bank.



12. Press the number of the register the effect is learned in. The effect will immediately run from its beginning.

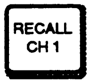
LESSON 2-13: RUNNING AND REVIEWING KEY FRAME EFFECTS

After you have stored a key frame effect in an E-MEM® register, you can run it simply by recalling the register while the [RECALL TO CUR EFF] pushbutton is turned off. However, if you turn the [RECALL TO CUR EFF] pushbutton on and recall the effect to the key frame current effect space, you have many more options. You can move through the effect in various ways, depending upon whether you want to see the entire effect or whether you want to review only a part of it. You can run it backwards. And you can edit it.

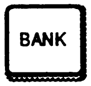


= *OFF*

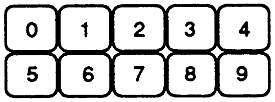
then



then



then

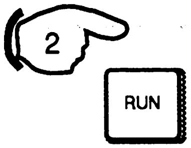


1. To recall the effect from E-MEM® storage back to the key frame current effect space, first select [RECALL TO CUR EFF] and one or more of the [RECALL] pushbuttons. For this tutorial, select [RECALL CH 1].

   Select the bank you used for storage by pressing [BANK] and then the number of the bank. Perform the recall operation by pressing the number of the register the effect is stored in.

Running a Key Frame Effect

You can use either the [RUN] pushbutton or the lever arm to run an entire key frame effect when it is in the current effect space, as follows:

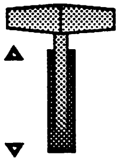


2. First, make sure [STOP NEXT] and [REV] are off. Press [RUN]. The effect will begin to run from the first frame immediately and will continue through the last frame. To stop the sequence at any point, press [RUN] again.

NOTE: *If you need frame-accurate synchronization of your key frame effect with the input video, you will need to use an editor. Refer to your editor manual for details of operation.*

then

then



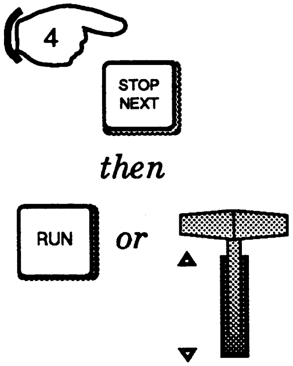
3. Press [REWIND] on the TRANSITION EFFECT section of the control panel; this cues up the first key frame in the effect so that it is ready to run from the beginning.

   Press [EFFECT] to delegate the lever arm to jog the effect. Move the lever from one limit to the other. The key frame effect will run from its beginning to its end and then stop.

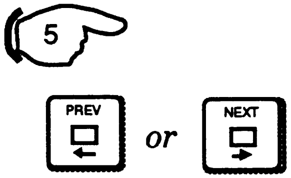
   Now move the lever off-limit and vary the speed and direction of movement. As you vary the speed of lever movement, the key frame effect will run faster or slower. When you change the direction of lever movement before reaching the other limit, the effect will run in the opposite direction. However, no matter how much you vary the speed and direction, one complete movement of the lever from limit to limit always produces one complete run of the effect as long as [STOP NEXT] is off.

Stepping Through a Key Frame Effect

There are two ways to step through an effect one key frame at a time, as described in Steps #4 and #5 below. You can start to step through the effect from any point along the effect path, either at or between key frames. If you want to start from the first key frame in the effect, press [REWIND]. To start from a specific key frame, press [GOTO KF], then the number of the key frame, then [ENTER].

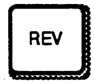


4. In the TRANSITION EFFECT section of the control panel, select [STOP NEXT]. When [STOP NEXT] is selected, the effect will run to the next key frame and stop there each time you either press [RUN] or move the lever from one limit to the other. To get out of [STOP NEXT] mode, press the pushbutton a second time.

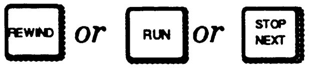


5. In the KEYFRAME section of the panel, press [PREV] to return to the previous key frame in the effect. Press [NEXT] to advance to the next key frame in the effect. These pushbuttons are lit only when there is a "previous" or "next" key frame, respectively, to select.

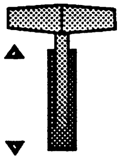
The Reverse Function



then



or



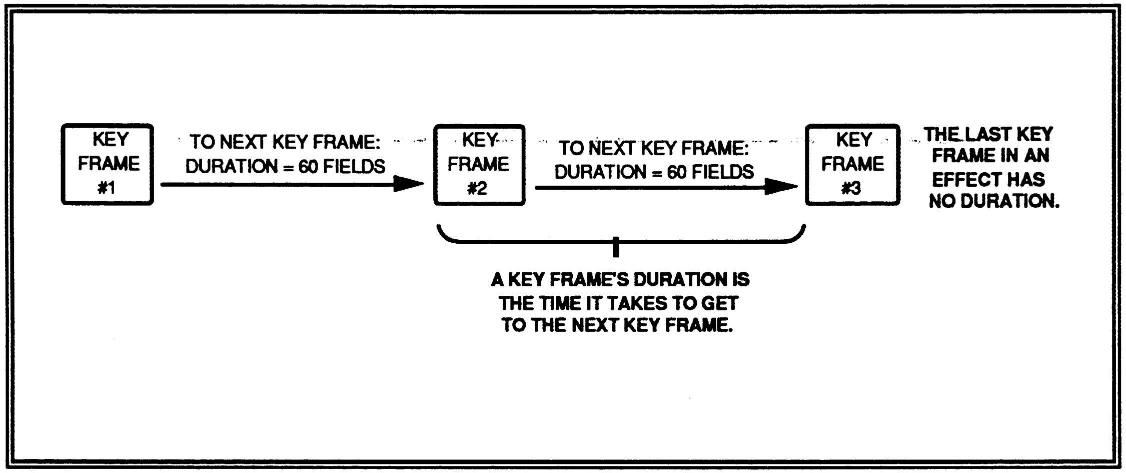
6. Selecting the [REV] pushbutton puts you into reverse mode and allows you to move through your key frame effect backwards.

   [REV] affects [REWIND], [RUN], the lever, and [STOP NEXT]. In reverse mode:

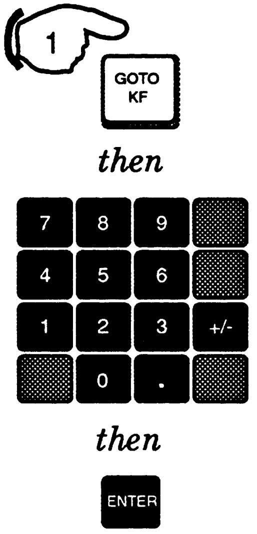
   > Pressing [REWIND] takes you to the last key frame of the effect and stops there.
   >
   > Pressing [RUN] runs the effect backwards from the point where you pressed [RUN] to the beginning of the effect.
   >
   > Pressing [STOP NEXT] causes the effect to move backwards to the previous key frame and stop there each time you either press [RUN] or move the lever from one limit to the other.
   >
   > Moving the lever runs the effect backwards.

NOTE: *Using "Hold", Motion Paths may produce unexpected results when running an effect in reverse.*

LESSON 2-14: CHANGING THE KEY FRAME DURATION


KEY FRAME #1
TO NEXT KEY FRAME: DURATION = 60 FIELDS
KEY FRAME #2
TO NEXT KEY FRAME: DURATION = 60 FIELDS
KEY FRAME #3
THE LAST KEY FRAME IN AN EFFECT HAS NO DURATION.
A KEY FRAME'S DURATION IS THE TIME IT TAKES TO GET TO THE NEXT KEY FRAME.

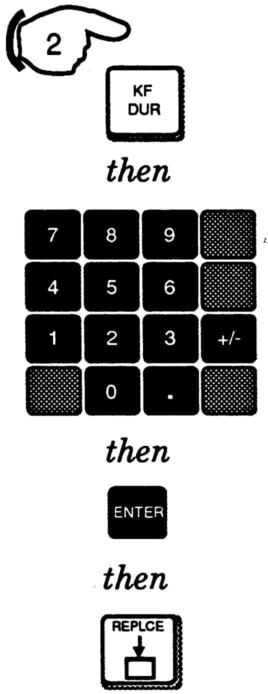
Default Duration Times: *When you first create a key frame effect, the default duration time between key frames is one second.*


1
GOTO KF
then
7
8
9
4
5
6
1
2
3
+/-
0
.
then
ENTER

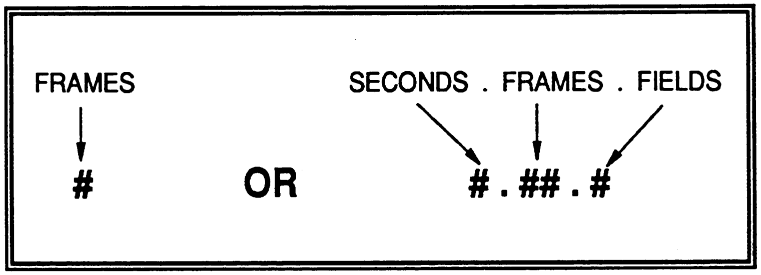
A key frame's duration is the total time it takes from the beginning of that key frame to the beginning of the following key frame. The default duration time is one second (25 frames in PAL and 30 frames in NTSC). You can change key frame duration times individually to be any length from one field to 99,999 seconds. You can also change the overall duration of a key frame effect.

Changing the Duration Of an Individual Key Frame

1. To change an individual key frame's duration, first select the key frame you want to change by pressing [GOTO KF], then the number of the key frame, then [ENTER].

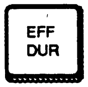

2
KF DUR
then
7 8 9
4 5 6
1 2 3 +/-
0 .
then
ENTER
then
REPLCE

2. Press [KF DUR]; the DIRECT ENTRY display will show the current duration time for the selected key frame (the KEYFRAME display will show which key frame is selected). Use the numbered keypad to enter a new time: you can either enter the number of frames directly <u>or</u> the number of seconds, a decimal point, the number of additional frames, another decimal point`s, and the number of additional fields, as shown below. Press [ENTER] to confirm the time, then press [REPLCE] to enter the new key frame time for the selected key frame.

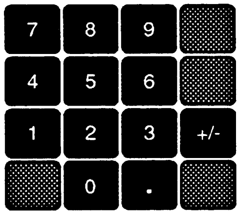

FRAMES
#
OR
SECONDS . FRAMES . FIELDS
# . ## . #

***NOTE:** Entering a 0 duration KF will default to one field.*

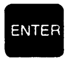
Changing the Duration of an Entire Key Frame Effect



then



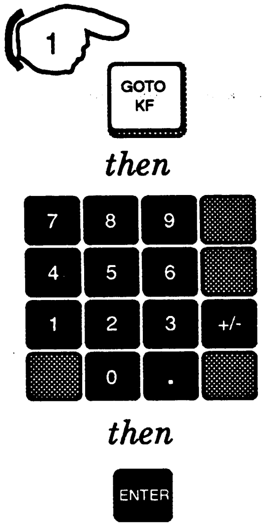
then



3. Press [EFF DUR]; the DIRECT ENTRY display will show the current duration time for the key frame effect in the current effect space. Use the numbered keypad to enter a new time: you can either enter the number of frames directly or the number of seconds, a decimal point, and the number of additional frames, another decimal point, and the number of additional fields. Press [ENTER] to confirm the time. The individual duration times for each key frame will be adjusted in proportion to the overall adjustment for the effect. For example, if the duration for the entire effect is doubled, each individual key frame duration will be doubled.

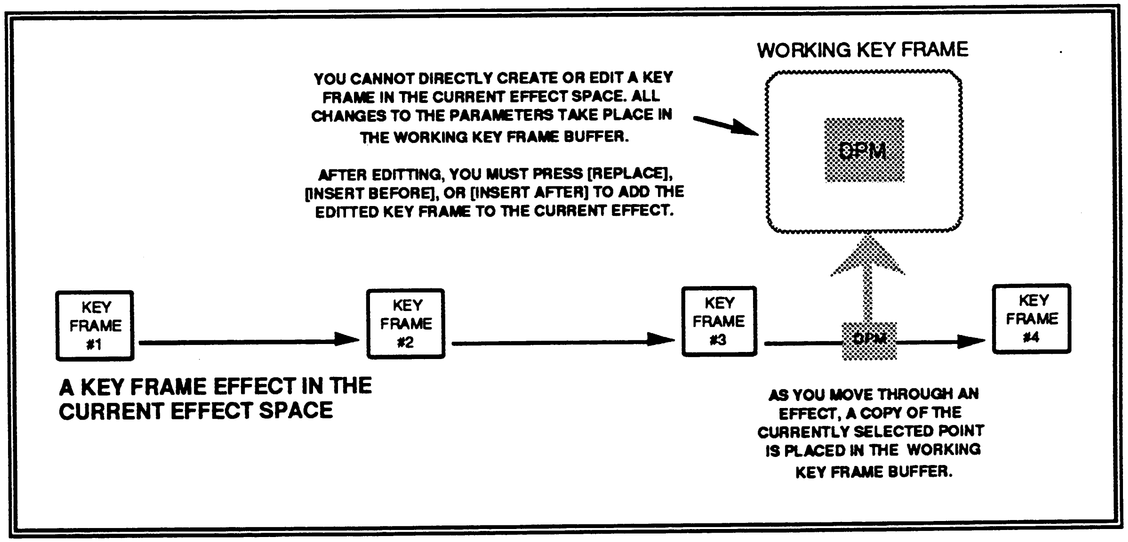
NOTE: *Sometimes reducing the Effect Duration will produce individual key frames that are less than one field. In this case the system will not let you enter the duration; the old value will be retained.*

LESSON 2-15:
INSERTING A KEY FRAME INTO AN EFFECT


1
GOTO KF
then
7
8
9
4
5
6
1
2
3
+/-
0
.
then
ENTER

1. You can insert a new key frame either before or after any other key frame in an effect sequence. Before doing so, recall the effect to the current effect space if it is not already there. Go to any of the existing key frames in the effect as follows: press [GOTO KF], enter a number, and press [ENTER].

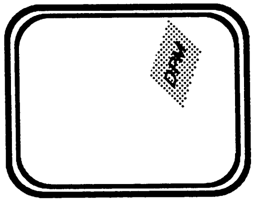
NOTE: Going to a key frame or any other point in an effect places a copy of that point into the working key frame buffer. It is this copy which changes as you edit; neither the original key frame nor the current effect changes in any way until you press [REPLCE], [DELETE], [INSERT BEFORE], *or* [INSERT AFTER].


WORKING KEY FRAME
YOU CANNOT DIRECTLY CREATE OR EDIT A KEY FRAME IN THE CURRENT EFFECT SPACE. ALL CHANGES TO THE PARAMETERS TAKE PLACE IN THE WORKING KEY FRAME BUFFER.
AFTER EDITTING, YOU MUST PRESS [REPLACE], [INSERT BEFORE], OR [INSERT AFTER] TO ADD THE EDITTED KEY FRAME TO THE CURRENT EFFECT.
DPM
KEY FRAME #1
KEY FRAME #2
KEY FRAME #3
DPM
KEY FRAME #4
A KEY FRAME EFFECT IN THE CURRENT EFFECT SPACE
AS YOU MOVE THROUGH AN EFFECT, A COPY OF THE CURRENTLY SELECTED POINT IS PLACED IN THE WORKING KEY FRAME BUFFER.

Editing an Effect: *All editing changes take place in the working key frame buffer and are then inserted into the current effect.*

2

Use the control panel to set up a key frame.



If you clear a working key frame, you can restore the data.

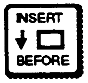
CLEAR
WORKNG
KF

2. Use the control panel to change the key frame parameters in the working key frame buffer. You can use any of the modifiers you have already learned: positioning, sizing, etc. You can also press [CLEAR WORKNG KF] to set all the parameters back to a known state: full size, no position or shape adjustment, all values = default values. As you work, your new key frame will be temporarily stored in the working key frame buffer.

NOTE. *When you clear the working key frame buffer, the data is stored in memory until you perform another [CLEAR WORKNG KF] or a [DELETE]. Until then, you can restore the cleared key frame data to the working key frame buffer exactly as it was before by pressing [RESTOR WORKING KF].*

EITHER

3a

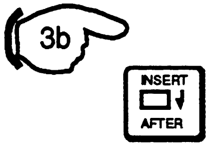


or

3. Decide whether you want to insert the new key frame into the current effect before or after the key frame you selected in Step 1. If before, perform Step 3.(a) below; if after, perform 3.(b).

   (a) Press [INSERT BEFORE] and the new key frame will be inserted before the selected one. For example, if you selected key frame #2, the new key frame will be inserted as key frame #2, and the original #2 becomes #3. All following key frames will be numbered one digit higher than they were before.

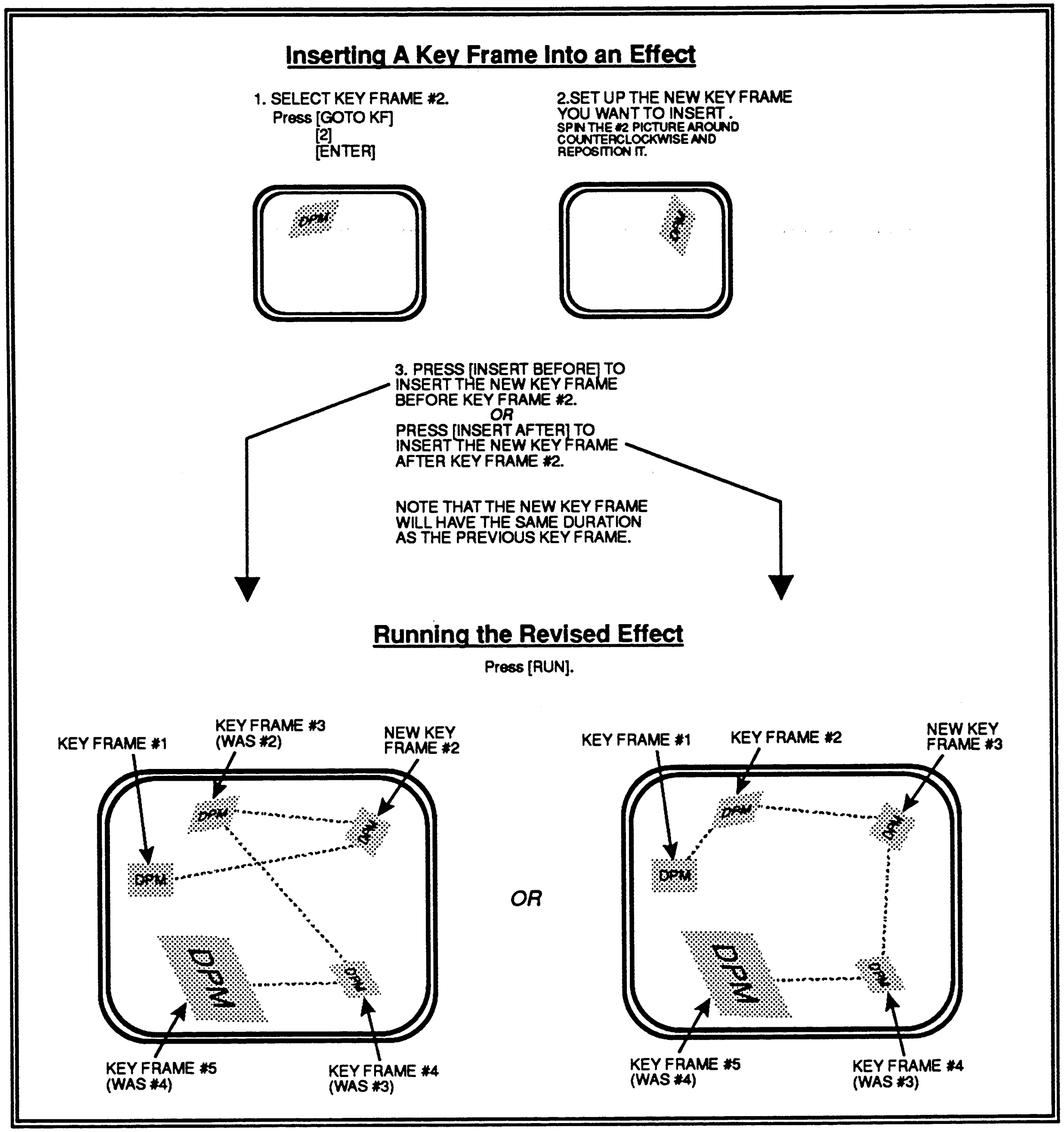
OR



(b) Press [INSERT AFTER] and the new key frame will be inserted after the selected one. For example, if you selected key frame #2, the new key frame will be inserted as key frame #3. All following key frames will be numbered one-digit-higher than they were before.

The new key frame will have a default key frame duration of 30 frames (25 frames in PAL). This will add frames to the overall duration of the key frame effect.

To run your revised current effect, press [REWIND] and [RUN].



Inserting A Key Frame Into an Effect

1. SELECT KEY FRAME #2.
Press [GOTO KF]
[2]
[ENTER]

2. SET UP THE NEW KEY FRAME YOU WANT TO INSERT.
SPIN THE #2 PICTURE AROUND COUNTERCLOCKWISE AND REPOSITION IT.

3. PRESS [INSERT BEFORE] TO INSERT THE NEW KEY FRAME BEFORE KEY FRAME #2.
OR
PRESS [INSERT AFTER] TO INSERT THE NEW KEY FRAME AFTER KEY FRAME #2.

NOTE THAT THE NEW KEY FRAME WILL HAVE THE SAME DURATION AS THE PREVIOUS KEY FRAME.

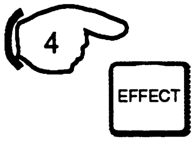
Running the Revised Effect

Press [RUN].

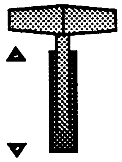
DPM
KEY FRAME #1
KEY FRAME #3 (WAS #2)
NEW KEY FRAME #2
KEY FRAME #5 (WAS #4)
KEY FRAME #4 (WAS #3)
OR
KEY FRAME #1
KEY FRAME #2
NEW KEY FRAME #3
KEY FRAME #5 (WAS #4)
KEY FRAME #4 (WAS #3)

Inserting a New Key Frame Into an Existing Effect: *You can insert (add) a new key frame either before or after any key frame in a current effect.*

You can also insert a new key frame at a point between two existing key frames, instead of before or after. The new key frame will be inserted into the path between the two frames and will split the duration time which was originally between the two, as shown in the figure on the next page. This is useful when you want to change one or more key frame parameters beginning at a point between key frames, but you don't want to change the overall duration of the effect.

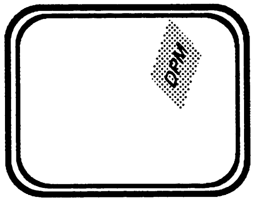


then

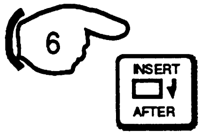


4. Press [EFFECT] to delegate the lever arm to jog the effect. Then use the lever arm to move to the point where you want to insert the new key frame. For this example, move to a point between key frame #2 and key frame #3. The status (parameters) of the effect at this point will be temporarily stored in the working key frame buffer.

Use the control panel to set up a key frame.



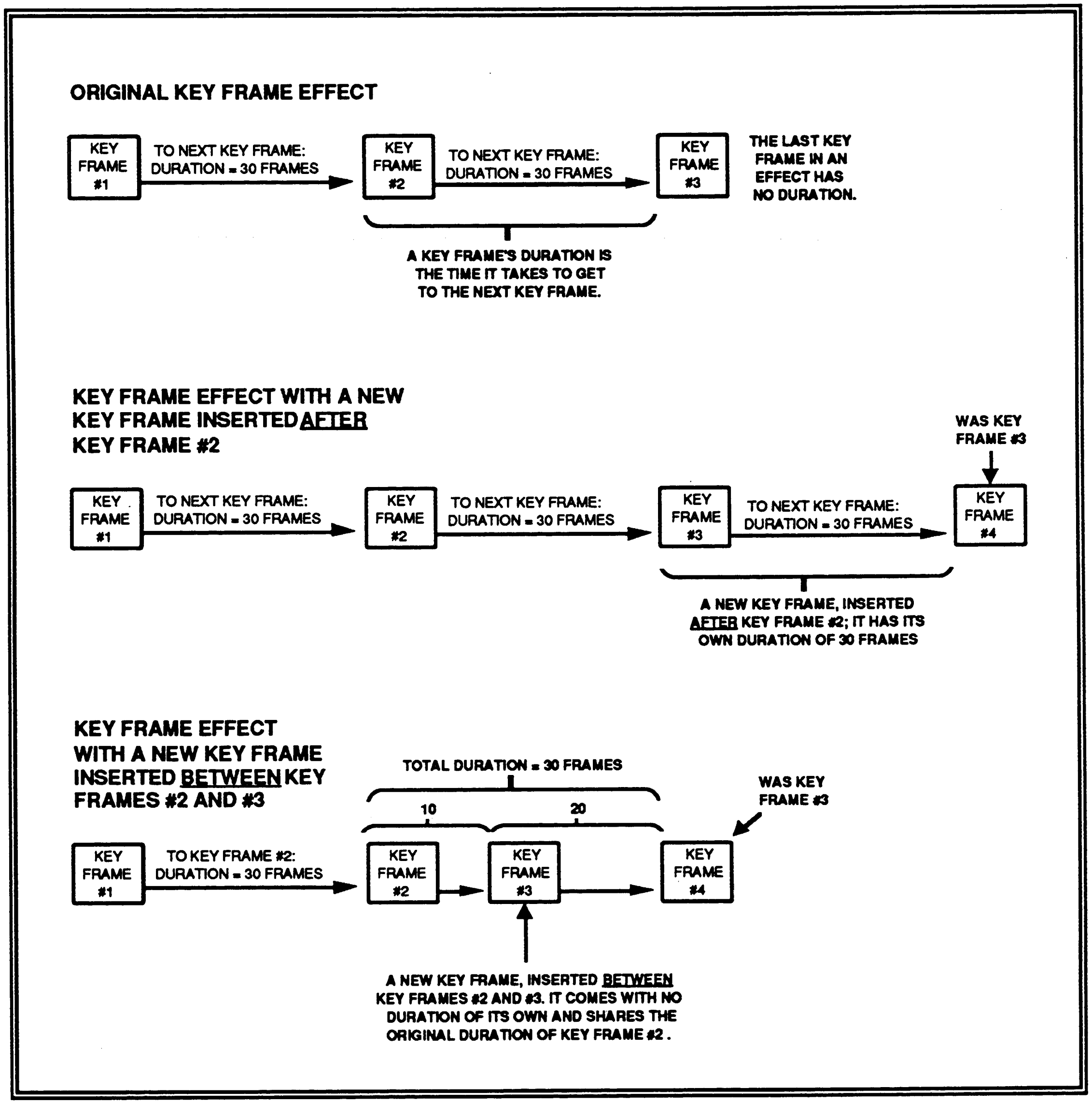
5. Use the control panel to set up a new key frame. You can use any of the modifiers you have already learned: positioning, sizing, etc. Any changes you make will change the parameters of the key frame in the working key frame buffer.



6. Press [INSERT AFTER]. The new key frame will be inserted into the current key frame effect at the point you selected in Step 4.

   Note that when you insert a key frame between two other key frames, it does not come with its own default duration of 60 fields. Instead, it will be inserted exactly at the point you selected in Step 4, dividing the original duration in proportion to its location between the two original key frames.

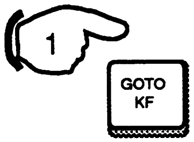
   To run your revised current effect, press [REWIND] and [RUN].


ORIGINAL KEY FRAME EFFECT
KEY FRAME #1
TO NEXT KEY FRAME: DURATION = 30 FRAMES
KEY FRAME #2
TO NEXT KEY FRAME: DURATION = 30 FRAMES
KEY FRAME #3
THE LAST KEY FRAME IN AN EFFECT HAS NO DURATION.
A KEY FRAME'S DURATION IS THE TIME IT TAKES TO GET TO THE NEXT KEY FRAME.
KEY FRAME EFFECT WITH A NEW KEY FRAME INSERTED AFTER KEY FRAME #2
KEY FRAME #1
TO NEXT KEY FRAME: DURATION = 30 FRAMES
KEY FRAME #2
TO NEXT KEY FRAME: DURATION = 30 FRAMES
KEY FRAME #3
TO NEXT KEY FRAME: DURATION = 30 FRAMES
WAS KEY FRAME #3
KEY FRAME #4
A NEW KEY FRAME, INSERTED AFTER KEY FRAME #2; IT HAS ITS OWN DURATION OF 30 FRAMES
KEY FRAME EFFECT WITH A NEW KEY FRAME INSERTED BETWEEN KEY FRAMES #2 AND #3
TOTAL DURATION = 30 FRAMES
10
20
KEY FRAME #1
TO KEY FRAME #2: DURATION = 30 FRAMES
KEY FRAME #2
KEY FRAME #3
KEY FRAME #4
WAS KEY FRAME #3
A NEW KEY FRAME, INSERTED BETWEEN KEY FRAMES #2 AND #3. IT COMES WITH NO DURATION OF ITS OWN AND SHARES THE ORIGINAL DURATION OF KEY FRAME #2.

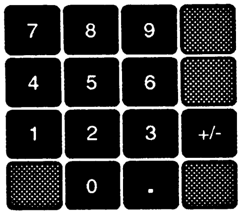
Inserting a New Key Frame Between Two Existing Key Frames: *When a key frame is inserted into the current effect between key frames instead of before or after, it will divide the original duration in proportion to its location between the two original key frames. It will not add any duration time to the current effect. If that key frame is then deleted, it will reduce the effect duration by its own duration.*

LESSON 2-16:
DELETING (REMOVING) A KEY FRAME FROM AN EFFECT

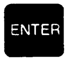
You can delete (remove) any key frame from the current effect. When you do, the key frames before and after the deleted one will link to form a new effect sequence. For example, if you delete key frame #3, the key frame which was #4 will become the new #3. All following key frames will be numbered one digit lower than they were before.



then

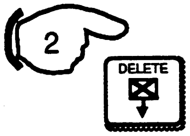


then



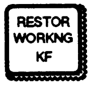
1. Select the key frame you want to delete:

   For this tutorial, use the DIRECT ENTRY section of the control panel to select key frame #3. Press:
   [GOTO KF]
   then [3]
   then [ENTER].

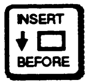


2. Press [DELETE] and the selected key frame will be deleted from the current effect.

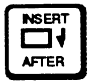
You can restore a deleted key frame.



then



or



Restoring a Deleted Key Frame: A deleted key frame is stored in memory until you perform another [DELETE] or a [CLEAR WORKNG KF]. Until then, you can restore the deleted key frame exactly as it was before by pressing [RESTOR WORKNG KF] and the appropriate insert pushbutton.

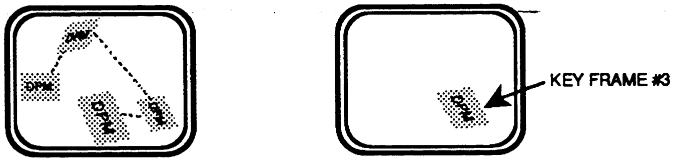
For example, if you deleted Key Frame #3 and want to restore it, first go to Key Frame #2. Now press [RESTOR WORKNG KF]; this will place the deleted key frame into the working key frame buffer. Press [INSERT AFTER] to insert the key frame into the current effect after Key Frame #2.

Deleting A Key Frame From an Effect

ORIGINAL KEY
FRAME EFFECT

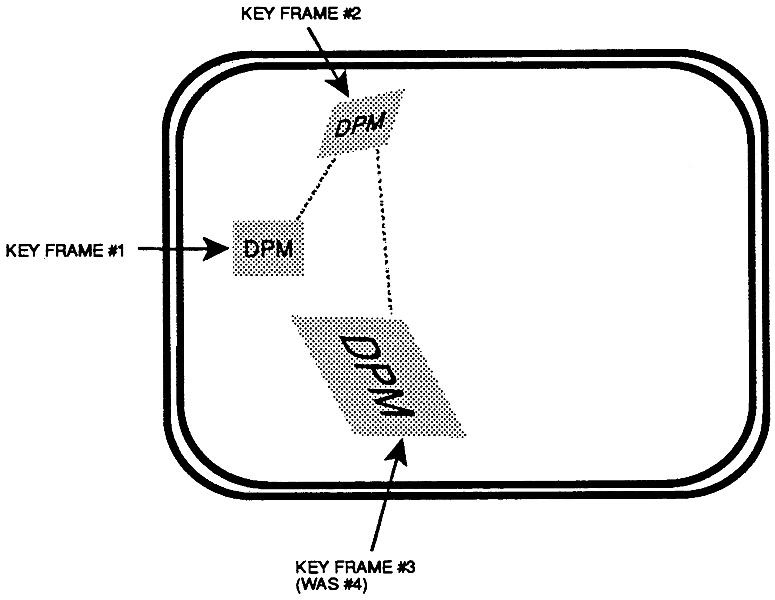
1. SELECT KEY FRAME #3.
PRESS [GOTO KF]
[3]
[ENTER]

2. PRESS [DELETE]
THE ORIGINAL KEY FRAME #4
BECOMES KEY FRAME #3.
ALL KEY FRAMES FOLLOWING THE
ONE YOU JUST DELETED WILL
NOW BE ONE NUMBER LOWER.


DPM
DPM
DPM
DPM
DPM
KEY FRAME #3

Running the Revised Effect

Press [RUN].

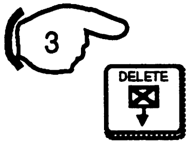

KEY FRAME #2
DPM
KEY FRAME #1
DPM
DPM
KEY FRAME #3
(WAS #4)

Deleting a Key Frame From an Effect: *You can delete (remove) any key frame from the current effect. If you change your mind, you can restore the deleted key frame exactly as it was before.*

Moving a Key Frame To Another Place In the Effect

You can use the delete/restore functions to move a key frame to another place in the current effect. This is possible because when you delete a key frame, it is placed into a special memory space. If you then move to another place in the effect, you can restore the deleted key frame to the working key frame buffer and insert it into the current effect in a new position.

NOTE: *The same memory space is used to store deleted key frames and cleared key frames. You can only store one key frame at a time in this space. Performing another [DELETE] or [CLEAR WORKNG KF] operation will overwrite any previously stored key frames.*



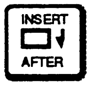
then

Move to another place in the current effect.

then

RESTOR
WORKNG
KF

then

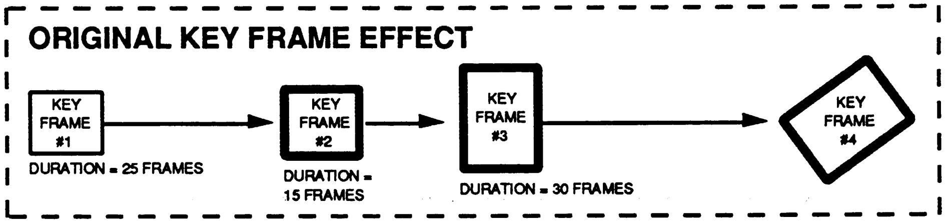


3. Go to the key frame you want to move. For this lesson, go to Key Frame #3.

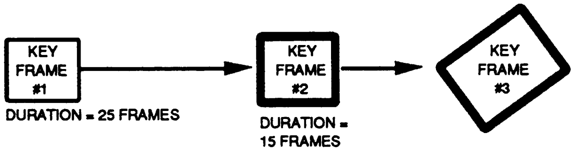
   Press [DELETE], then move to Key Frame #1. Press [RESTOR WORKNG KF] to place the deleted key frame in the working key frame buffer.

   Press [INSERT AFTER] to enter the deleted key frame into the current effect after Key Frame #1. The Key Frame which was originally #3 will now be in the #2 position.

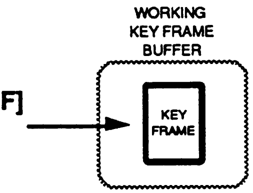
NOTE: *Depending on where you want the key frame inserted, you can press* [INSERT BEFORE] *OR* [REPLACE] *instead of* [INSERT AFTER].


ORIGINAL KEY FRAME EFFECT
KEY FRAME #1
DURATION = 25 FRAMES
KEY FRAME #2
DURATION = 15 FRAMES
KEY FRAME #3
DURATION = 30 FRAMES
KEY FRAME #4

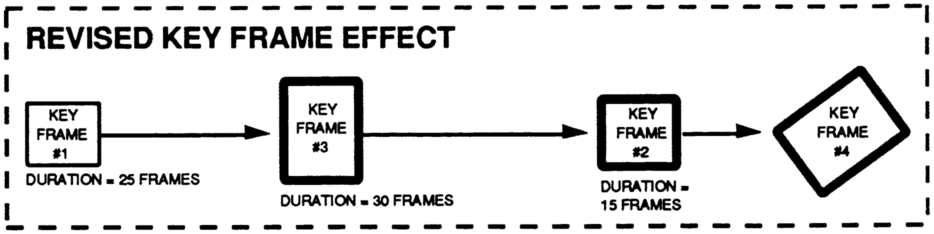
1. Go to Key Frame #3 and press [DELETE].
The original Key Frame #3 will be deleted from the effect.


KEY FRAME #1
DURATION = 25 FRAMES
KEY FRAME #2
DURATION = 15 FRAMES
KEY FRAME #3

2. Go to Key Frame #1, then press [RESTOR WORKNG KF] to place the deleted key frame into the working key frame buffer.


WORKING KEY FRAME BUFFER
KEY FRAME

3. Press [INSERT AFTER]. The deleted key frame, which was originally Key Frame #3, will be inserted into the current effect as Key Frame #2.


REVISED KEY FRAME EFFECT
KEY FRAME #1
DURATION = 25 FRAMES
KEY FRAME #3
DURATION = 30 FRAMES
KEY FRAME #2
DURATION = 15 FRAMES
KEY FRAME #4

Moving a Key Frame: *You can use the delete function to move any key frame to another position in the current effect. This example shows you how to move Key Frame #3 to the #2 position.*

Duplicating a Key Frame and Inserting the Duplicate Into Another Place In the Effect

You can use the clear/restore functions to duplicate a key frame and then insert the duplicate in another place in the current effect. For example, you might want to duplicate the first key frame and insert it as the last key frame in the effect as well.

4

CLEAR WORKNG KF

then

Move to another place in the current effect.

then

RESTOR WORKNG KF

then

INSERT AFTER

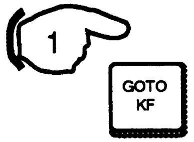
4. Go to the key frame you want to duplicate. For this lesson, go to Key Frame #1.

   Press [CLEAR WORKNG KF]; this places Key Frame #1 into memory without removing it from the effect.

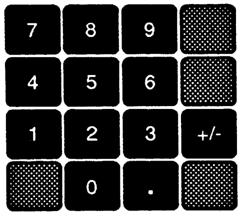
   Move to the last key frame in the effect and press [RESTOR WORKNG KF]; then press [INSERT AFTER]. A duplicate of Key Frame #1 will now be inserted into the effect as the last key frame. When you run the effect, it will start and finish in the same place.

NOTE: *The same memory space is used to store cleared key frames and deleted key frames. You can only store one key frame at a time in this space. Performing another* [CLEAR WORKNG KF] *or* [DELETE] *operation will overwrite any previously stored key frames.*

LESSON 2-17: REPLACING A KEY FRAME IN AN EFFECT

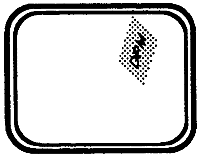


then



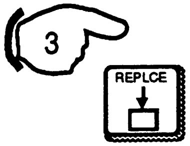
then

Use the control panel to set up a key frame.



OR

CLEAR WORKNG KF



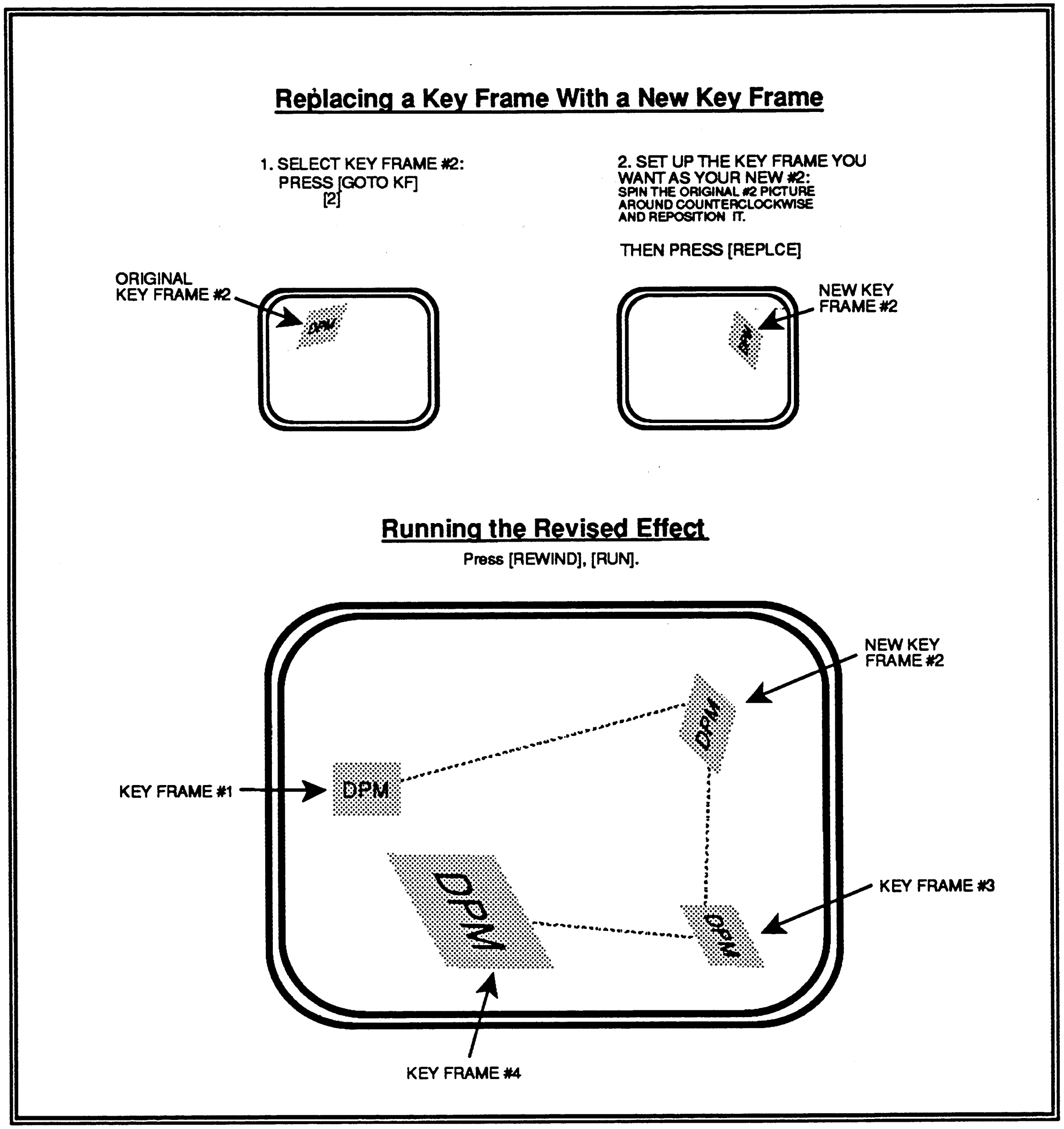
1. To replace a key frame in the current effect with a new key frame, first go to the key frame you want to replace.

   For this tutorial, use the DIRECT ENTRY section of the control panel to select Key Frame #2. Press:
      [GOTO KF]
      then [2]
      then [ENTER].

2. Use the control panel to set up a new key frame picture on the working key frame buffer. You can use any of the modifiers you have already learned: positioning, sizing, etc. You can also press [CLEAR WORKNG KF] to set all of the working key frame parameters back to a known state: full size, no position or shape adjustment, all values = default values.

3. Press [REPLCE] and the key frame in the working key frame buffer will replace the selected one. For example, if you selected key frame #2, the new key frame will be inserted as key frame #2, and the original #2 will be deleted from the current effect.

NOTE: *When you replace a key frame, that key frame will be permanently erased. It is not stored in a buffer and it cannot be restored.*


Replacing a Key Frame With a New Key Frame
1. SELECT KEY FRAME #2:
PRESS [GOTO KF]
[2]
2. SET UP THE KEY FRAME YOU WANT AS YOUR NEW #2:
SPIN THE ORIGINAL #2 PICTURE AROUND COUNTERCLOCKWISE AND REPOSITION IT.
THEN PRESS [REPLCE]
ORIGINAL KEY FRAME #2
DPM
NEW KEY FRAME #2
Running the Revised Effect
Press [REWIND], [RUN].
NEW KEY FRAME #2
KEY FRAME #1
DPM
DPM
DPM
DPM
KEY FRAME #3
KEY FRAME #4

Replace a Key Frame With a New Key Frame: *You can replace any key frame in the current effect with a new one.*

LESSON 2-18: KEY FRAME PATH CONTROL

The Path menu allows you to modify your key frame effect by programming the way the picture changes and moves.

The menu has several different levels. As an aid to understanding how the different levels work, you will find a tree chart of the {Path} menu located at the end of the "Dictionary of Controls" section of this manual. You will also find a summary of the path control parameters on the next page.

A key frame effect creates a programmed motion path for a video picture that changes as it moves along the path. Only at key points is the picture specifically defined in terms of parameters such as size, location, shape, etc.; these points are key frames. The value of the parameters between key frames, and the way in which the parameters change between one key frame and the next, is computed by the DPM-700. This process is called key frame interpolation or **inbetweening**. You can adjust inbetweening using path controls:

- The path control parameters can be hold, linear, s-linear, or smooth. For example, the picture could be held in its Key Frame #1 position for the duration of the key frame and then move to Key Frame #2 instantaneously; this is a hold. It could move between the two in a straight line; this is linear. Non-location transforms such as size and aspect also change according to the same path control parameters.

- You can program rotation/spin, aspect/skew, location/center-of-rotation, post transform, and perspective differently for each key frame.

- You can adjust each key frame separately or adjust the entire effect path at once.

- If you have the optional second channel installed in your system, you can adjust path control for each channel and for global transforms separately.

PATH CONTROL PARAMETERS: A SUMMARY

1. Press {Path} to enter the path control menu. Select the parameters you want to edit:
    - {All} (all transform parameters)
    - {Loc/CR} (location and center of rotation)
    - {Rot/Sp} (rotation and spin)
    - {As/Skw} (aspect and skew)
    - {Post} (post transform)
    - {Psp} (perspective)
    - {Holds} (a sub-menu lets you select additional non-transform parameters and special effects for holds)
2. Select a path control; this will determine the way in which the parameters change between key frames:
    - {Hold} (parameters are held for the duration of the key frame, then change instantaneously)
    - {Linear} (constant rate of speed and constant direction)
    - {S-Lin} (constant direction but variable rate of speed)
    - {Smooth} (variable direction and variable rate of speed)
    - {Curve} (allows very fine adjustment of the tension {Tenson}, continuity {Cont}, and bias {Bias} of the path)
3. You can adjust each key frame separately or adjust the entire current effect at once.
    - To adjust a single key frame, go to the key frame, use the Path menu to make the changes, and press [REPLCE].
    - To adjust the entire effect, select {ModAll} from the [MODIFY] menu, use the Path menu to make the changes, and press [REPLCE].

The following tutorial lesson explains these steps in detail.

1
DELEGATION
CH 1
OUTPUT
CH 1

1. Select [CH 1] in the DELEGATION and OUTPUT sections of the control panel.

NOTE: In order to perform this lesson, you must have a key frame effect in the current effect space. Lesson 2-11 describes how to create an effect.

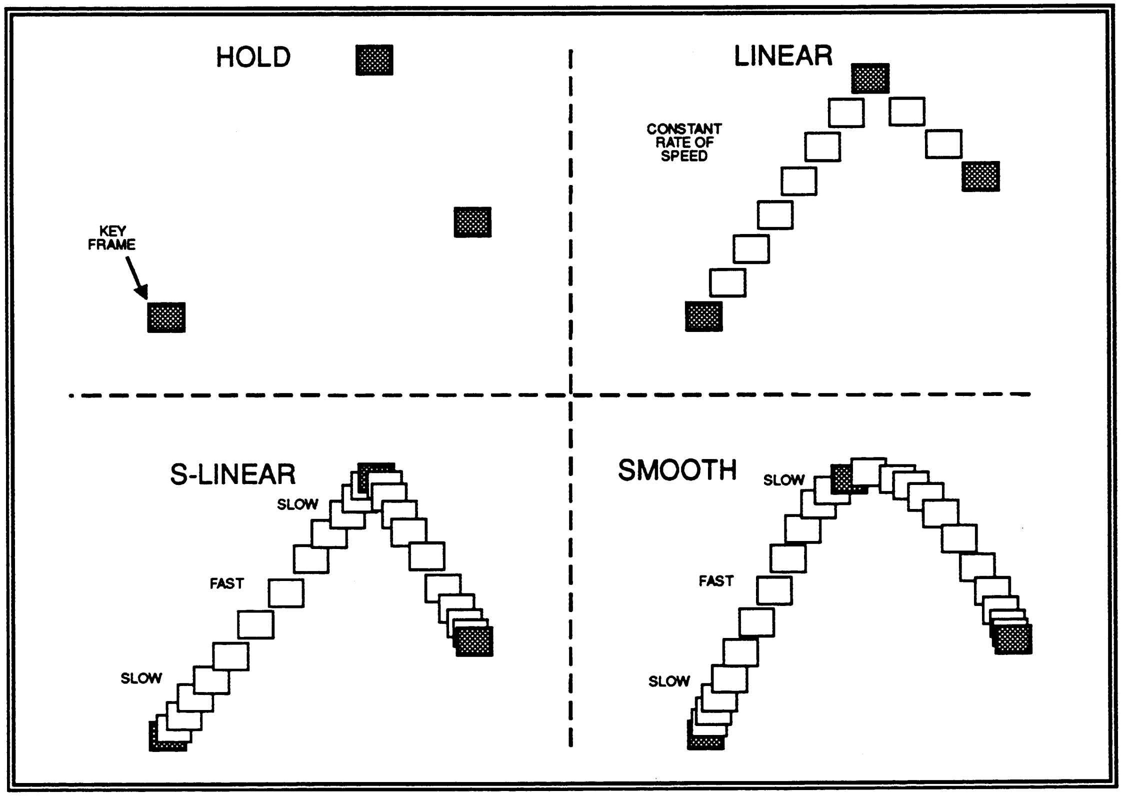
2
Path
then
Loc/CR

2. In the Home Menu, press {Path} to enter the key frame effect editing program. A new menu will appear which lets you select the parameters you want to edit, as follows:
   - {All} allows you to edit all of the picture transform parameters at the same time and in the same way.
   - {Loc/CR} selects location and center of rotation as the parameters to be edited.
   - {Rot/Sp} selects rotation and spin.
   - {As/Skw} selects aspect (X and Y size) and skew.
   - {Post} selects post transform.
   - {Psp} selects perspective.
   - {Holds} takes you to another menu which allows you to select additional non-transform parameters and special effects which can be programmed for a hold function.

   For this lesson, select {Loc/CR}. This will allow you to edit the parameters for location and center of rotation.

During this lesson, you will experiment with different path controls so that you can see the wide variety of possible effects. The path control you select determines the way the parameters change between key frames; the selection can be a hold (instantaneous), linear, s-linear, or smooth (see the illustration below).

{Hold} causes the parameter to remain unchanged during the key frame duration and then change its value all at once. For example, the picture will jump from its location in one key frame to its new location in the next key frame instantly.


HOLD
KEY FRAME
LINEAR
CONSTANT RATE OF SPEED
S-LINEAR
SLOW
FAST
SLOW
SMOOTH
SLOW
FAST
SLOW

Inbetweening: *You can adjust the way in which the parameters change between key frames using different path controls. (Shown with same path control at all key frames.)*

In addition to transform holds, you can place holds on several other parameters:

- Border Width: each edge
- Crop Width: each edge
- Matte: chroma; luma; and saturation
- Picture: solarization; polarization; defocus; false color
- Keyer: output key; combiner; fade-to-black
- Sfx: mosaic; size; aspect
- Recursive: decay; star; strobe

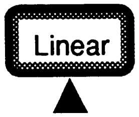
{Linear} causes the parameter to change at a constant rate of speed in a constant direction. For example, the picture will move from one location to the next in a straight line at a constant speed. {S-Lin} causes the parameter to change in a constant direction but at a variable rate of speed. For example, the picture will move from one location to the next in a straight line; it will begin slowly, speed up, then slow down again as it approaches the next key frame. Because of the changing rate of speed, S-linear changes appear less abrupt than linear changes.

{Smooth} causes the parameter to change in a variable direction and at a variable rate of speed. For example, the picture will move from one location to the next in a smoothly curved line. Smooth is the least abrupt type of path control; both direction and rate of speed are kept smooth and steady in appearance.

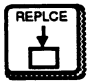
NOTE: *When you first create a key frame effect, smooth will be the default path control.*

NOTE: S-Lin will actually stop at the key frame point for one full frame. This may allow recursive montage effects to be produced without jitter caused by placing a montage at two different spots in the frame

3. Once you have decided on a parameter change formula, you can either apply it to a single key frame or apply it to the entire effect, as described below:



then



then run your effect

a. Changing a Single Key Frame: Go to Key Frame #2, select {Linear}, and press [REPLCE]. This will cause the location and center of rotation parameters to change in a linear fashion at Key Frame #2.

Run your effect. Notice how the parameter change at Key Frame #2 differs from the change at other key frames.

3b

MODIFY

then

ModAll

then

HOME
EXIT

then

Linear

then

REPLCE

*then run
your effect*

***NOTE:** When using the MODIFY selection in the STREAMLINE DIRECT menu, press [HOME / EXIT] once to put you directly back to the path menu you were in. Holding [HOME / EXIT] will put you back to the top menu.*

b. Changing the Entire Effect to Linear: On the control panel, press [MODIFY] and select [ModAll] from the menu. Press [HOME/EXIT] and then select {Linear}.

On the control panel, press [REPLCE]. This will cause the location and center of rotation parameters to change in a linear fashion for every key frame in the effect.

Run your effect. Notice that as the effect approaches and leaves each key frame position, there is an abrupt change in direction, almost as if the picture "bounced" at the key frame point. The speed of the picture is constant throughout the effect.

3c
MODIFY
then
ModAll
then
HOME EXIT
then
S-Lin
then
REPLCE
then run your effect

c. Changing the Entire Effect to S-Linear: Repeat the first part of Step b) above: On the control panel, press [MODIFY] and select {ModAll} from the menu. Press [HOME/EXIT] and then select {S-Lin}.

On the control panel, press [REPLCE]. This will cause the location and center of rotation parameters to change in an S-linear fashion for every key frame in the effect.

Run your effect. Notice that S-linear path control does not have the "bounce" effect that Linear has. This is because of the deceleration into and acceleration out of each key frame that now occurs.

3d
Go to a key frame, then
Hold
then
REPLCE
then run your effect

d. Changing a Single Key Frame: Go to Key Frame #2, select {Hold}, and press [REPLCE] to insert Hold as the path control for that Key Frame. When you run the key frame, the location parameters will not change for the duration of Key Frame #2, then will change instantaneously at Key Frame #3.

Run your effect. Notice how the instantaneous parameter change at Key Frame #2 differs from the s-linear change at other key frames.

Go to key frame #2 again, deselect {HOLD}, and press [REPLCE] to turn off the hold function before proceeding with the next step.

The final path control is {Curve}, which can effect all parameters but is especially effective when used with location. Curve is actually a combination of three separate path controls: tension, continuity, and bias (Steps 4, 5, and 6 respectively). Tension, continuity, and bias interact with one another; when you enter a value for one of these , the effect it has will vary slightly according to the values set for the other two.

4

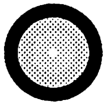
Go to a key frame,
or
turn on {ModAll},
then

Curve
▲

then

Tenson
▲

then



STREAMLINE™
SOFT KNOB

then

REPLCE

4. **Tension** {Tenson} is the characteristic of location which determines how sharply the curve bends at a key frame position. Speed is also affected by tension. The sharper the curve at the keyframe the slower the speed at the key frame. The effect decelerates into and accelerates out of the key frame. For some effects, you may want to adjust the tension of the motion path and change the amount of curve at the key frame position.

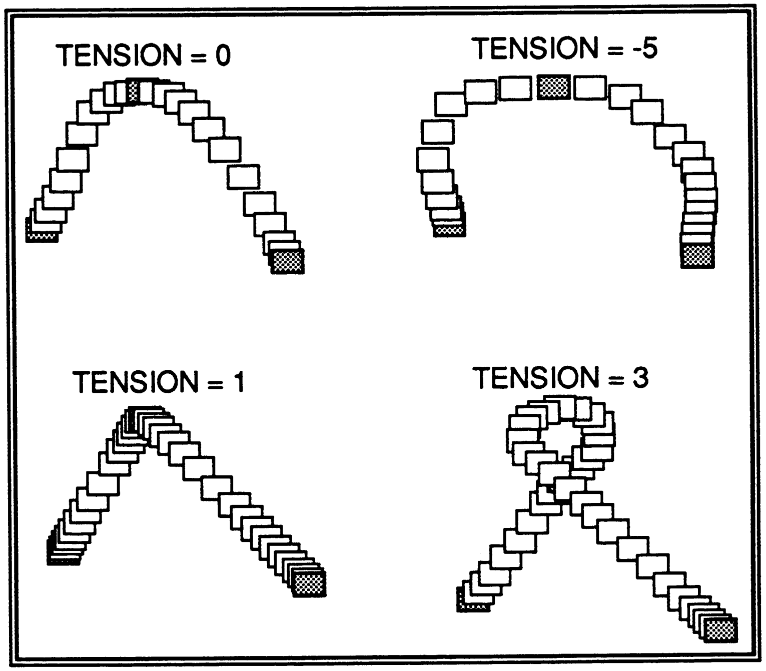
   You can adjust either a single key frame or the entire effect, as follows:
   - If you want to apply the curve tension to a single key frame, first use [GOTO KF] to go to the desired key frame.
   - If you want to apply the curve tension to the entire effect, first go to the [MODIFY] menu and turn on {ModAll}.

   Select {Curve} from the {Path} menu and then select {Tenson}; the word will appear in all capital letters to show that it is selected. The word "Tenson" will also appear in the upper right-hand corner of the STREAMLINE™ display to show that the soft knob is now delegated to this function.

Turn the knob or use the keypad to adjust the tension. The tension value will be displayed in the DIRECT ENTRY display.

- A tension of -5 will produce a loose curve.
- A tension of 1 will produce a very tight curve; it will be almost linear.
- A tension of 2 or greater will cause the path to be so tight, and the curve so sharp at the keyframe, that it will loop away from the curve and then back to the path before exiting the keyframe location.

Press [REPLCE] to apply the tension value.



Curve Tension: *Tension determines the sharpness of the curve and speed through the curve, as the motion path passes through the key frame position. Tension interacts with Continuity and Bias, which are assumed to be set to zero in this diagram. The values are applied to all key frames.*

5

Go to a key frame,
or
turn on {ModAll},
then

Curve
▲
then

Cont
▲
then

STREAMLINE™
SOFT KNOB

then

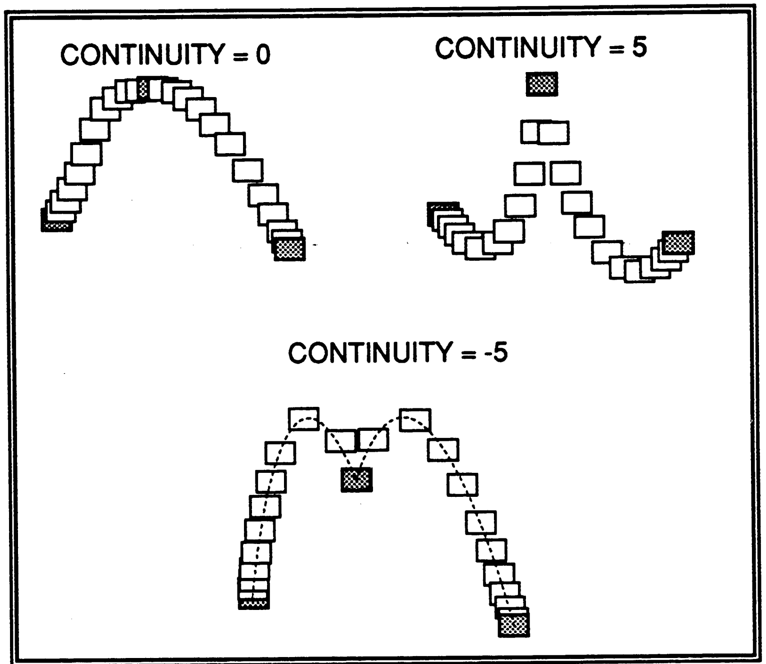
REPLCE

5. **Continuity** {Cont} is the characteristic of location which determines whether the motion path continues smoothly, without interruption. For some effects, such as animating a bouncing ball, for example, you may want to introduce a discontinuity in the motion at the point of impact. You would do this by placing a key frame at that point and adjusting its continuity.

   You can adjust either a single key frame or the entire effect, as follows:
   - If you want to apply the curve tension to a single key frame and not to all key frames, first use [GOTO KF] to go to the desired key frame.
   - If you want to apply the curve tension to the entire effect, go to the [MODIFY] menu and turn on {ModAll}.

   Select {Curve} from the {Path} menu and then select {Cont}; the word will appear in all capital letters to show that it is selected. The word "Cont" will appear in the upper righthand corner of the display to show that the soft knob is now delegated to this function.

   Turn the knob or use the keypad to adjust the continuity. The continuity value will be displayed in the DIRECT ENTRY display. Press [REPLCE] to apply the continuity value.



Continuity: *The characteristic of location/positioning which determines whether the motion path continues smoothly, without interruption. The speed will vary; the sharper the curve, the faster the motion. Continuity interacts with Tension and Bias, which are assumed to be set to zero in this diagram. The values are applied to all key frames.*

6

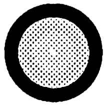
Go to a key frame,
or
turn on {ModAll},
then

Curve
▲

then

Bias
▲

then



STREAMLINE™
SOFT KNOB

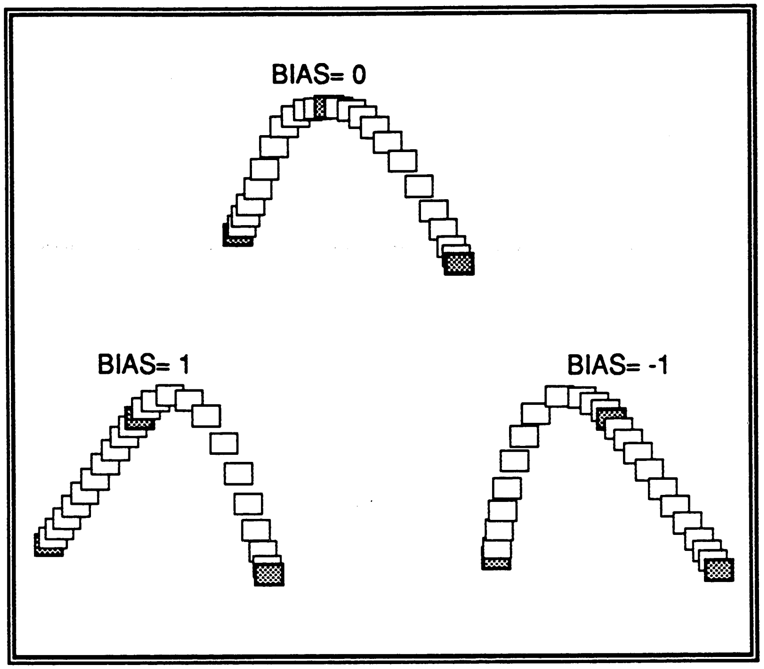
then

6. **Bias** {Bias} is the characteristic of location which controls the symmetry of the motion path as it passes through a key frame position. For some effects, you may want to change the symmetry of the motion path so that it overshoots or undershoots the key frame position.

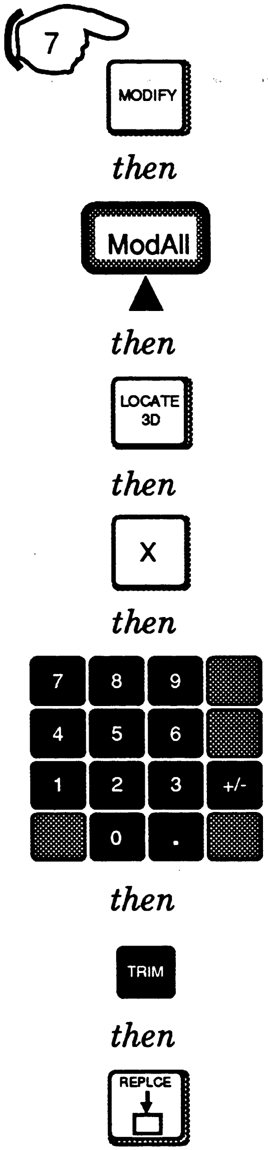
   You can adjust either a single key frame or the entire effect, as follows:
   - If you want to apply the curve tension to a single key frame and not to all key frames, first use [GOTO KF] to go to the desired key frame.
   - If you want to apply the curve tension to the entire effect, go to the [MODIFY] menu and turn on {ModAll}.

   Select {Curve} from the {Path} menu and then select {Bias}; the word will appear in all capital letters to show that it is selected. The word "Bias" will appear in the upper righthand corner of the display to show that the soft knob is now delegated to this function.

   Turn the knob or use the keypad to adjust the bias. The bias value will be displayed in the DIRECT ENTRY display. Press [REPLCE] to apply the value.



***Bias:** The characteristic of location / positioning which controls the symmetry of the motion path as it passes through a key frame position. Bias interacts with Tension and Continuity, which are assumed to be set to zero in this diagram. The values are applied to all key frames.*



Other Ways to Use {ModAll}: The Modify menu [MODIFY] contains a specialized function, called {ModAll}, that allows you to change every key frame in an effect at the same time and in the same way. You have already seen how {ModAll} can be used to apply {Path} parameter changes to every key frame in an effect simultaneously.

You can also use {ModAll} with parameter changes made using other menus or using the control panel. This universal adjustment can be very useful if you want to perform an operation such as adding a border to every key frame or relocating an entire effect by trimming all of the key frames to the left, as follows:

NOTE: *{ModAll} allows you to preview your changes before making them permanent. Enable {MODALL} and make the changes. Run the effect and test the changes. To abandon the changes, deselect {ModAll}. If they are good, press [REPLCE]. This makes the changes permanent and exits ModAll.*

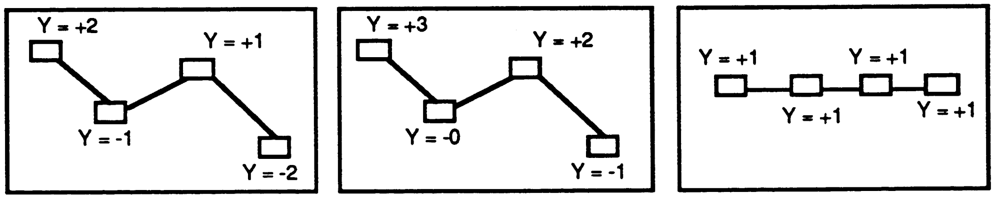
7. On the control panel, press [MODIFY] and then press {ModAll}. The words will appear in all capital letters—{MODALL}—to show that the function is selected.

   If you have any key frames in your current effect, the word "ALL" will appear in the KEYFRAME display where a number would normally appear. This serves as a reminder to you that {MODALL} is on.

For this lesson, select [LOCATE 3D] and [X]. Key in the value -.5, press [TRIM], and then press [REPLCE]. When you press [TRIM], all key frames will move .5 screen units to the left. When you press [REPLCE] {ModAll} will turn off automatically.

NOTE: *If you change your mind about accepting the modification, you can always undo the last Modall by pressing [LAST X].*

8. **Absolute Modall Versus Relative Modall.** Using the softknob, the joystick, or the trim (keypad function), will do a relative modall. Using the keypad, the softknob, or the joystick and then hitting {ENTER], will do an absolute modall. Relative "trims" all values by the changed amount. Absolute gives that exact value to all key frames.



Original Effect Relative Modall—Trim by +1 Absolute Modall—Sets to +1

Relative Modall vs Absolute Modall

LESSON 2-19: USING THE GLOBAL "CHANNEL" AND TRANSFORMS

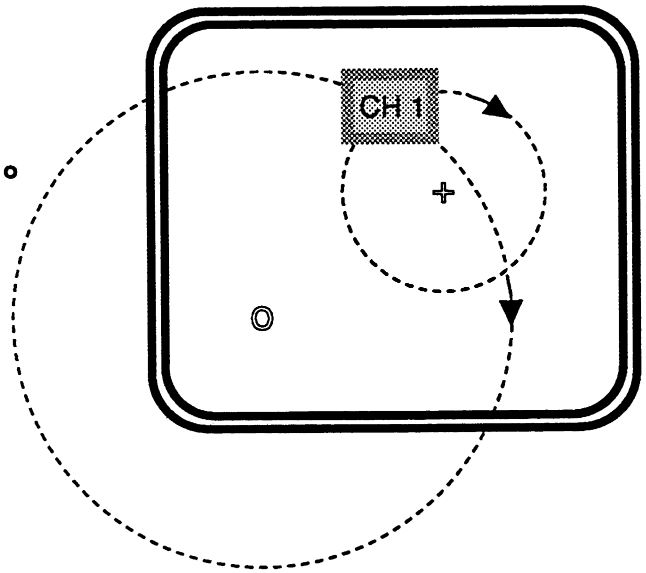
The Global channel gives you a second set of transform parameters for creating key frame effects. It also allows you to combine the two video channels and manipulate them together.

So far in this tutorial, you have built key frame effects and performed transforms using only Channel 1 and its transform parameters. The DPM-700 also has a standard *Global channel.* Unlike Channel 1, the Global channel has no video inputs of its own; it acts upon the input picture(s) for Channel 1 and Channel 2 (optional).

The Global channel offers two advantages: it provides an additional set of transform parameters; and, if you have Channel 2 installed, it allows you to manipulate the two channel pictures together, as if they were one picture.

The Channel 1 picture is rotating around Channel 1's center of rotation: +

At the same time, it is also orbiting around the Global center of rotation: o



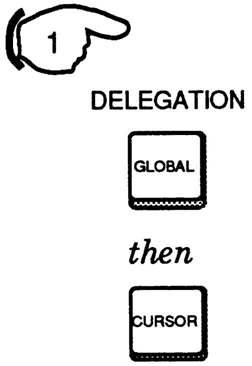
Powerful Transform Capabilities: *The Global channel has its own transforms in addition to those available on Channel 1. This allows you to create intricate transform effects.*

NOTE: *If you have the Second Channel option, any global functions you perform will affect both channels in exactly the same way. For example, if you perform a global rotation, the Channel 1 picture and the Channel 2 picture will rotate together around the global center of rotation as if they were a single picture..*

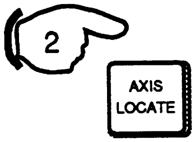
Performing Global Transforms

Performing a global transform is the same as performing a channel transform except that you select [GLOBAL] in the panel DELEGATION section.

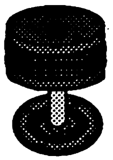
NOTE: *The set of Global parameters do not include skewing or aspect (Size X, Size Y); you must use Channel 1 or the optional Channel 2 to perform a skew or aspect operation.*



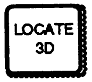
1. Turn on the Global center of rotation cursor as follows:
   - Select [GLOBAL] in the DELEGATION section of the control panel.
   - Toggle the [CURSOR] pushbutton to light it. A "◎" cursor will appear on your monitor screen to mark the Global center of rotation.



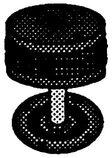
then



then



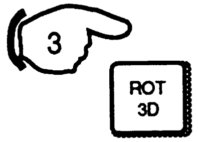
then



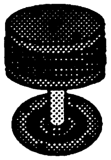
2. Select [AXIS LOCATE]. There are two ways to position the center of rotation:
    a. Move the joystick knob in the direction you want the center of rotation to move: left/right is the X axis value; backward/forward is the Y axis value; turning the knob adjusts the Z axis value.
    b. Select [X], [Y], or [Z], enter a value using the DIRECT ENTRY keypad, and press [ENTER]. Note that X values greater than +/- 4 and Y values greater than +/- 3 will move the center of rotation off-screen.

   Once you have positioned the center of rotation, you may want to reposition the center of the picture. To do this, select [LOCATE 3D] (toggle [AXIS LOCK] off if you want the cursor to stay in place) and use the joystick or keypad to change the X, Y, and/or Z values. Remember that the distance between the center of the picture and the center of rotation will establish the radius of the spins.

NOTE: *If you are using two channels, the two pictures will be treated as one and will have the same global center of rotation; however, the channel centers of rotation can be different since they have their own sets of transform parameters.*



then



3. Select [ROT 3D], then use the joystick to rotate around the axes in all three directions. The picture will rotate around the Global axes and not around its own.

Select [SPIN] for creating effects with multiple turns about an axis.

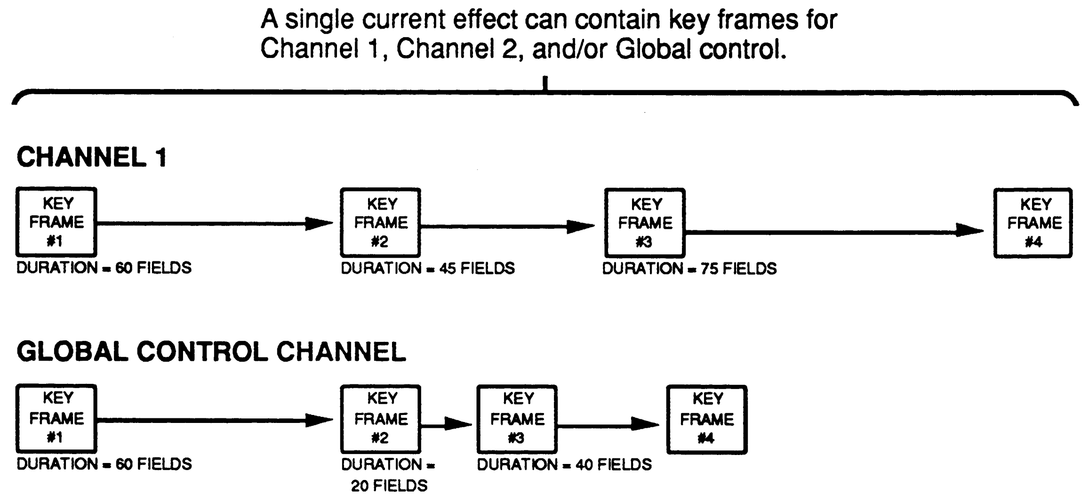
Spin values are entered as the number of complete circles plus a percentage of a circle, with a decimal point separating the two numbers. Positive values spin the picture in a clockwise direction; negative values spin it in a counterclockwise direction.

You can create key frame effects using Channel 1 alone or using it with Global Control added. Global Control parameters are stored on a separate Global channel.

Creating Key Frame Effects Using the Global Control Channel

Previous to the current lesson, you have used only the Channel 1 video path for your key frame effects. That is, the control panel was delegated to [CH 1] when you created your key frames, inserted them into the current effect, and edited them.

You can create more complex key frame effects by also using the Global channel in your current effect. This channel is separate from Channel 1, but the two channels are tied together in time.


A single current effect can contain key frames for Channel 1, Channel 2, and/or Global control.
CHANNEL 1
KEY FRAME #1
DURATION = 60 FIELDS
KEY FRAME #2
DURATION = 45 FIELDS
KEY FRAME #3
DURATION = 75 FIELDS
KEY FRAME #4
GLOBAL CONTROL CHANNEL
KEY FRAME #1
DURATION = 60 FIELDS
KEY FRAME #2
DURATION = 20 FIELDS
KEY FRAME #3
DURATION = 40 FIELDS
KEY FRAME #4

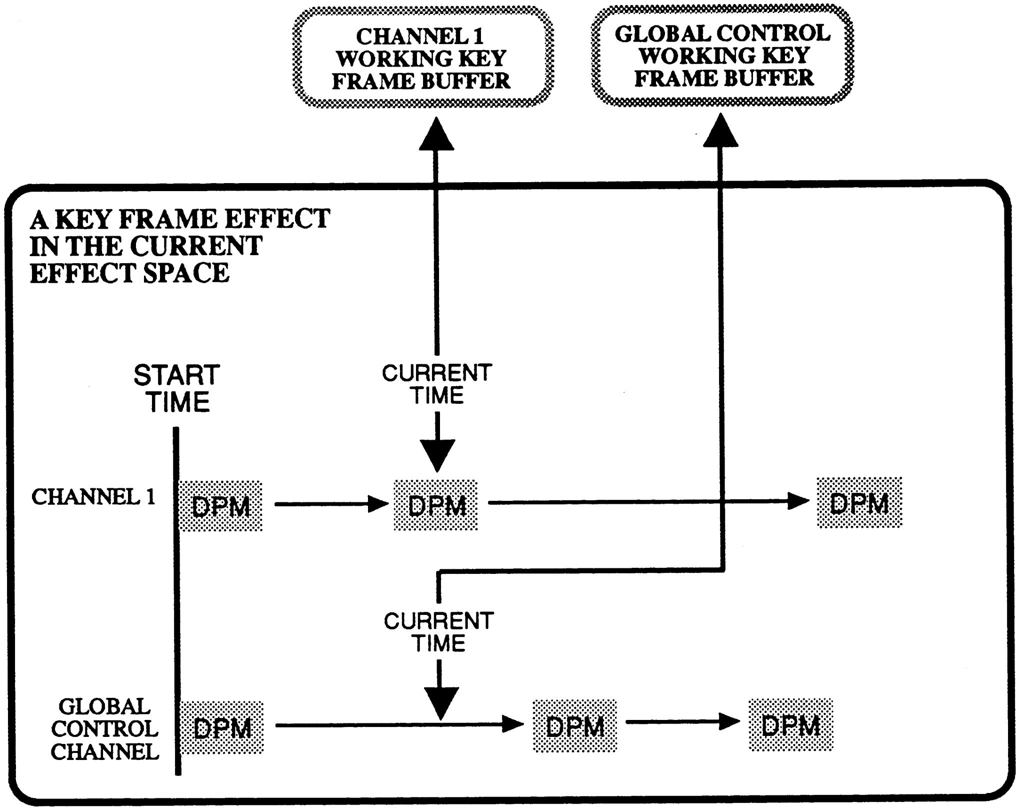
Current Effects With Multiple Channels: *A current effect can contain from one to three different channels: Channel 1, Channel 2 (optional), and Global Control. The channels are separate but parallel in time. This allows you to work with each channel individually, but to run them together as a single key frame effect.*

The next few pages contain a general description of what the global control channel is and how you can use it to build a current effect. If you have never worked with a digital picture manipulator before, we suggest that you read these pages carefully before performing the tutorial steps.

The Global Control channel has no video inputs of its own; instead it acts upon the Channel 1 video inputs as follows:

- Global Control has a set of transform parameters of its own, separate from the Channel 1 parameters; the only difference is that skew is not available as a Global transform. You can use this second set of parameters to create complex motion paths. For example, you could have two different centers of rotation for the picture to move around (with the Second Channel option, you could have three different centers).
- The Global Control channel also contains information for keyer background selection, Combiner transition states, Fade-to-Black operations, and the optional Recursive effects. These functions are described later in this manual.

NOTE: If you have the Second Channel option, any global functions you perform will affect both channels in exactly the same way. For example, if you perform a global orbit, the Channel 1 picture and the Channel 2 picture will orbit together around the global center of orbit as if they were a single picture. However, the individual channels' centers of rotation can be adjusted separately.


CHANNEL 1 WORKING KEY FRAME BUFFER
GLOBAL CONTROL WORKING KEY FRAME BUFFER
A KEY FRAME EFFECT IN THE CURRENT EFFECT SPACE
START TIME
CURRENT TIME
CHANNEL 1
DPM
DPM
DPM
CURRENT TIME
GLOBAL CONTROL CHANNEL
DPM
DPM
DPM

Working Key Frame Buffers For Multiple Channels: *Each current effect channel has its own working key frame buffer. The key frame buffers are separate. They can be controlled and edited either separately or together, depending on how the control panel is delegated. However, they will always be lined up at the same point in time in the current effect.*

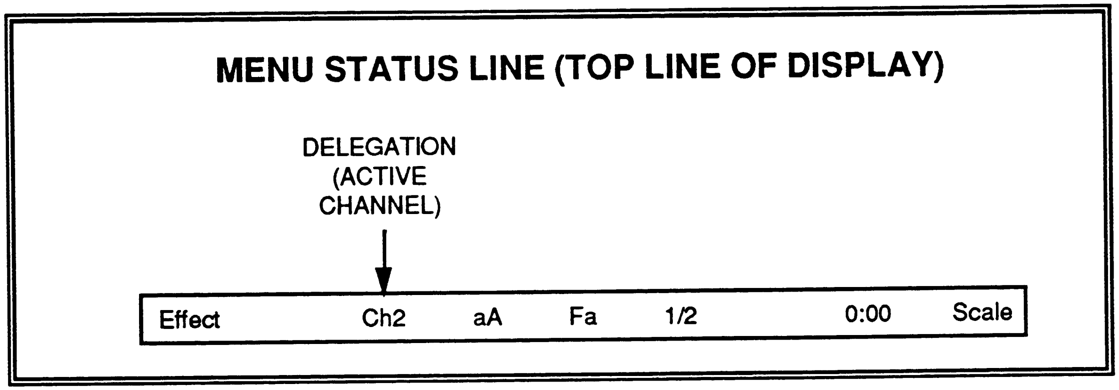
When you have more than one channel in a current effect, you can choose whether to control one at a time or to control two or three together. You do this by selecting one as your active channel; the other channel or channels can then be "modify" channels or "inactive" (not selected) channels .

ACTIVE CHANNEL:

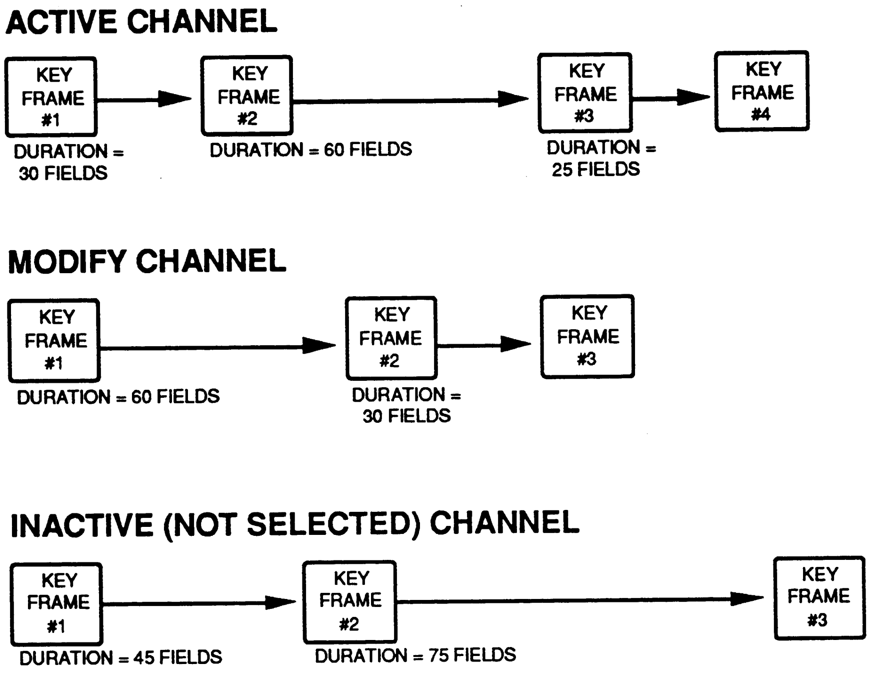
- The active channel will be affected by any operations you perform, including key frame editing.
- Its status will be shown by the KEYFRAME display and pushbuttons, as if it were the only channel in the current effect.
- Select it by pressing the desired pushbutton in the DELEGATION section of the control panel.

MODIFY CHANNEL:

- A modify channel will be affected by any changes made in the active channel , including key frame editing.


MENU STATUS LINE (TOP LINE OF DISPLAY)
DELEGATION (ACTIVE CHANNEL)
Effect
Ch2
aA
Fa
1/2
0:00
Scale

Active Channel Status: *The display always shows the active channel. Others lit in the DELEGATION section are modify channels.*


ACTIVE CHANNEL
KEY FRAME #1
DURATION = 30 FIELDS
KEY FRAME #2
DURATION = 60 FIELDS
KEY FRAME #3
DURATION = 25 FIELDS
KEY FRAME #4
MODIFY CHANNEL
KEY FRAME #1
DURATION = 60 FIELDS
KEY FRAME #2
DURATION = 30 FIELDS
KEY FRAME #3
INACTIVE (NOT SELECTED) CHANNEL
KEY FRAME #1
DURATION = 45 FIELDS
KEY FRAME #2
DURATION = 75 FIELDS
KEY FRAME #3

The **ACTIVE CHANNEL** will be affected by any operations you perform. Its status will be shown in the KEYFRAME display.

A **MODIFY CHANNEL** will be affected by any changes made in the active.

If a channel is **INACTIVE**, it will not be affected by any changes made in the active channel.

Active and Modify Channels: *If you want the changes you make in the active channel to also be made in another channel (for example, inserting a key frame), you can select the second channel to be a modify channel. Hold down the active channel pushbutton in the DELEGATION section and press the modify channel pushbutton(s).*

- Its status will not be shown in the KEYFRAME display or by the pushbuttons.
- Select channels for modifying by holding down the active channel pushbutton and pressing the desired modify channel pushbutton(s) in the DELEGATION section.

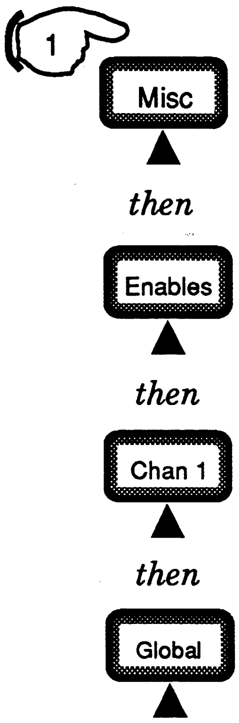
INACTIVE CHANNEL:

- If a channel is not selected for an active or modify state, it will not be affected by any changes made in the active channel .
- Its status will not be shown in the KEYFRAME display or by the pushbuttons.

To simplify editing, you can temporarily disable one or more of the effect channels: {Chan 1}, {Chan 2}, and/or {Global}. Controls for this are available in the STREAMLINE™ {Misc} menu.

When a channel has been disabled, the parameter changes programmed on that channel will not be shown on the monitor when an effect is run. This is only for monitoring purposes; neither the input picture nor the programming itself will be affected in any way. For example, if Channel 1 were disabled, its input picture would be visible on the DPM-700 outputs. However, the picture would not move or change according to Channel 1 parameters when you ran the current effect. It will change according to any existing Global channel parameters.

- Enable {Chan 1} if you want to see Channel 1's parameters change.
- Enable {Chan 2} to see Channel 2's parameters change.
- Enable {Global} to see the Global Control parameters change (since Global has no input pictures of its own, you will normally have at least one channel enabled if Global is enabled).



1. For this lesson, enable channel 1 and the global channel. Select {Misc} and then {Enables}. In the Home Menu, press {Chan 1} and {Global} until the names appear in all capital letters—{CHAN 1} and {GLOBAL}—to show that they are enabled. They will be capitalized already if they were not previously disabled.

NOTE: *The {Enabls} function temporarily disables changes in channel parameters from appearing on the outputs (disabled channels are lowercase). The effect itself will not be changed or edited in any way. Use the DELEGATION section of the panel to select channels for editing. Use the OUTPUT section to select which channels are visible on the output.*

NOTE: *You will need to make sure the current effect space is empty before you create your new Channel 1/Global effect. To do this, recall E-MEM® register #00.*

a. In the E-MEM® section, select [RECALL TO CUR EFF]*; the pushbutton will light.*

b. Hold down the [RECALL GLOBAL] *pushbutton for 1/2 second; all three* [RECALL] *pushbuttons will light.*

c. Press [BANK] *then* [0] [0] *to recall register #00.*

2

DELEGATION

Hold down CH 1

then

GLOBAL

then

Hold down CLEAR WORKNG KF

2. Hold down [CH 1] in the DELEGATION section and press [GLOBAL]. This selects Channel 1 as the active channel and Global Control as a modify channel. Hold down [CLEAR WORKNG KF] for 1/2 second to clear both the Channel 1 and Global working key frames and return the picture to its user default state.

3

DELEGATION

CH 1

3. Press [CH 1]; this selects Channel 1 as the active channel so that you can build an effect using Channel 1 only.

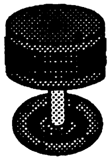
NOTE: *Normally you will find it easiest to build effects if you have the panel delegated to one channel at a time and switch channels as needed. Remember that only the status of the active channel is shown in the KEYFRAME section of the panel.*

4. To begin building the effect, enter several key frames with Channel 1 as follows:

4a

SIZE

then



a. Select [SIZE] and make the Channel 1 DPM picture smaller.

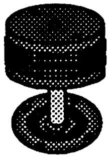
4b

AXIS LOCK

then

LOCATE 3D

then

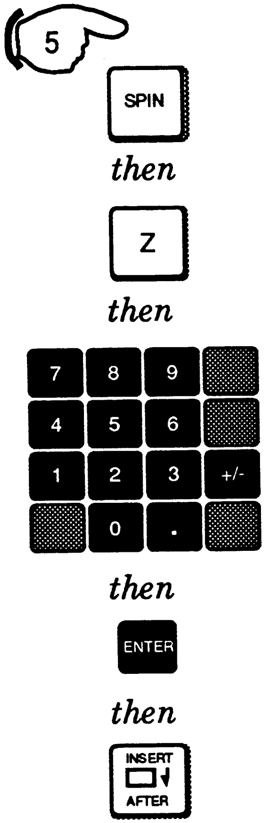


then

INSERT AFTER

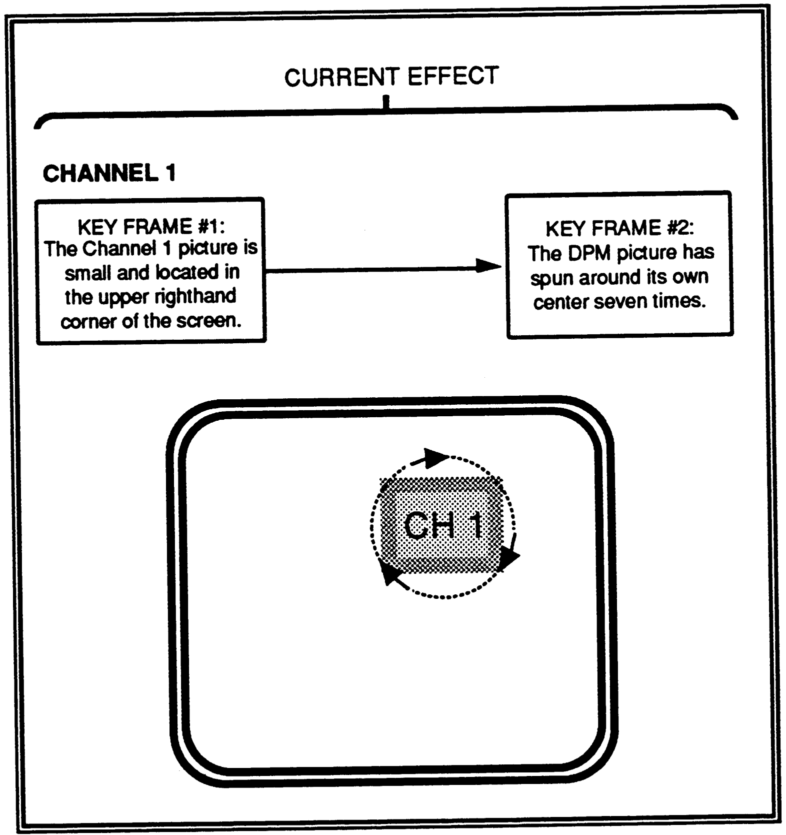
b. Toggle [AXIS LOCK] on and then press [LOCATE 3D] and move the picture and the center of rotation together to the upper right hand corner of the screen.

Insert this new working key frame into the current effect as Key Frame #1.


5
SPIN
then
Z
then
7
8
9
4
5
6
1
2
3
+/-
0
.
then
ENTER
then
INSERT
AFTER

5. Select [SPIN] and [Z], key in 7 (for seven complete spins), and press [ENTER]. Insert this state into the current effect as Key Frame #2.

   Now run the effect. The picture will spin in place seven times. This is a Channel 1 effect and uses only Channel 1's parameters.


CURRENT EFFECT
CHANNEL 1
KEY FRAME #1: The Channel 1 picture is small and located in the upper righthand corner of the screen.
KEY FRAME #2: The DPM picture has spun around its own center seven times.
CH 1

Current Effect Channels: *Each channel in a current effect—Channel 1, Channel 2, and Global—can be programmed independently from the others.*

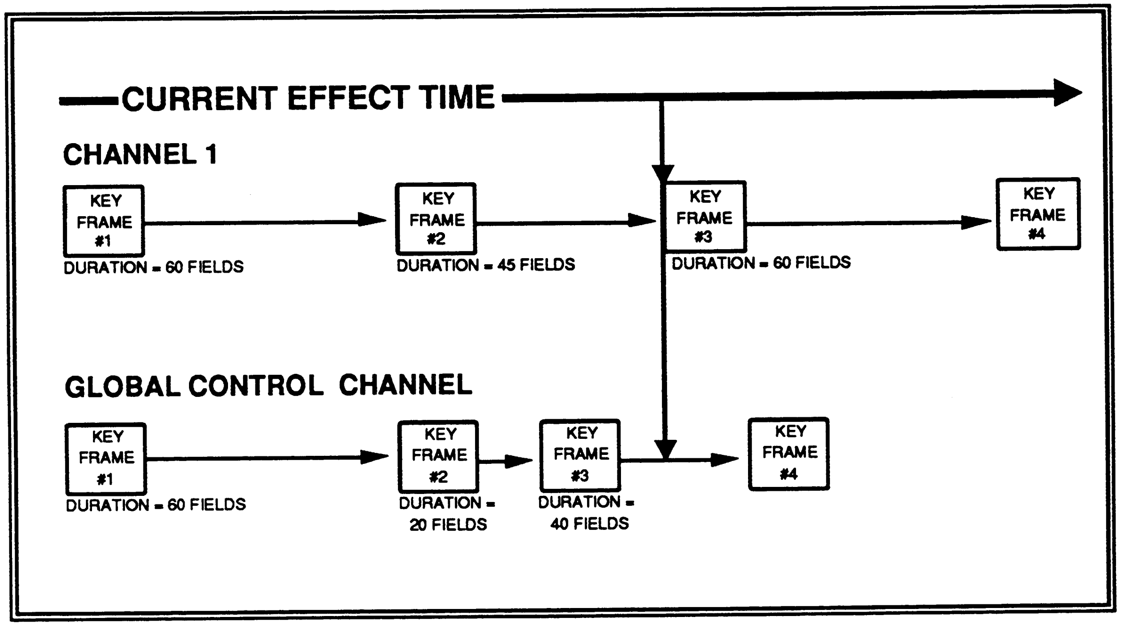
NOTE: All current effect channels are tied together in time. As you move through a current effect, you will always be at the same point of time in all of the channels. The KEYFRAME display will show the status of the active channel.

6 DELEGATION

GLOBAL

6. Go to Key Frame #1 for Channel 1; the KEYFRAME display will show "1."

   Press [GLOBAL]; this changes panel delegation and selects Global Control as the active channel. Note that the KEYFRAME display is now blank, since there are no key frames in the Global channel.

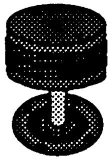

CURRENT EFFECT TIME
CHANNEL 1
KEY FRAME #1
DURATION = 60 FIELDS
KEY FRAME #2
DURATION = 45 FIELDS
KEY FRAME #3
DURATION = 60 FIELDS
KEY FRAME #4
GLOBAL CONTROL CHANNEL
KEY FRAME #1
DURATION = 60 FIELDS
KEY FRAME #2
DURATION = 20 FIELDS
KEY FRAME #3
DURATION = 40 FIELDS
KEY FRAME #4

Current Effect Time: *You will always be at the same point in time in all channels. In this example, if you are on Key Frame #3 of Channel 1, you will be between Key Frames #3 and #4 in the Global Control Channel.*

7

AXIS LOCATE

then

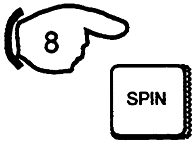


then

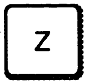
INSERT AFTER

7. Select [AXIS LOCATE] and move the global cursor into the lower lefthand part of the screen.

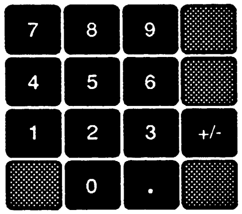
   Insert this picture into the current effect as Key Frame #1 of the Global control channel. Channel 1 will not be changed.



then

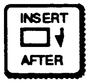


then



then

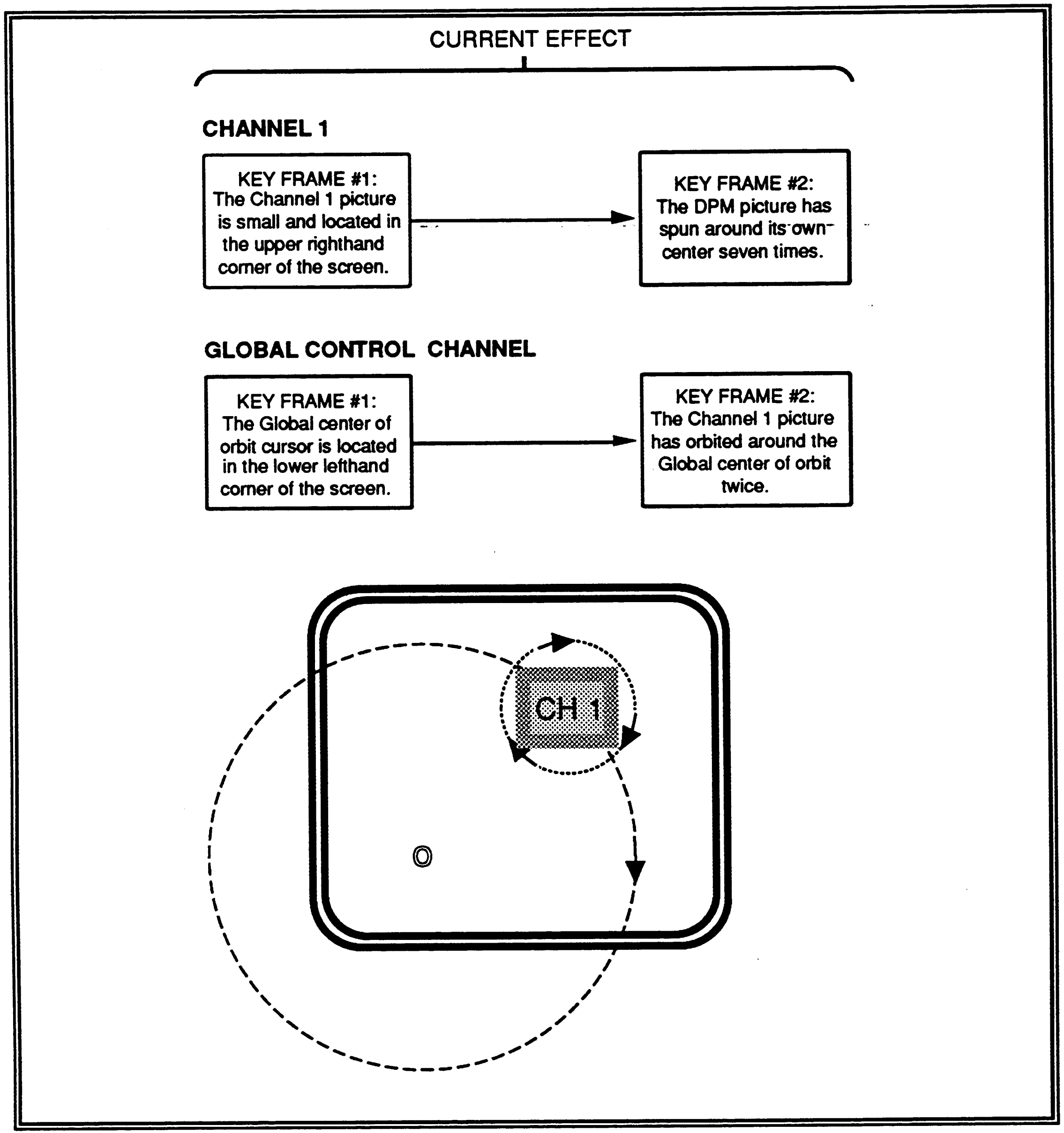
then



8. Select [SPIN] and [Z], key in 2 (for two complete spins), and press [ENTER]. Insert this state into the current effect as Key Frame #2 of the Global channel.

   Now run the effect. The picture will spin seven times while it orbits twice around the global center of rotation. This is a combination Channel 1/Global effect.

NOTE: *Remember that Channel 1 and Global have separate sets of transform parameters. Selecting* [SPIN] *in Step 8 uses the Global parameters because the panel is currently delegated to the Global channel. Before, in Step 5, selecting* [SPIN] *used the Channel 1 set of spin parameters because the panel was delegated to Channel 1.*



KEY FRAME #1: The Channel 1 picture is small and located in the upper righthand corner of the screen.

KEY FRAME #2: The DPM picture has spun around its own center seven times.

KEY FRAME #1: The Global center of orbit cursor is located in the lower lefthand corner of the screen.

KEY FRAME #2: The Channel 1 picture has orbited around the Global center of orbit twice.

Creative Effects: *You can create and edit the video channels and the Global channel separately, then run them together to produce intricate motion paths. All channels in an effect are synchronized in time and run on the same timeline.*

Working With Modify Channels

So far in this tutorial you have built your current effect by selecting Channel 1 and Global in turn as your active channel. The other channels have been inactive; that is, they have not been affected when you made a change in the active channel.

The DPM-700 gives you another option: you can select one or two "modify" channels in addition to the active channel. When you make a change in the active channel, the modify channels change too.

Any key frame operation you perform, such as a [REPLCE] or an [INSERT AFTER], will affect the modify channel as if it were the active channel. The difference is that the KEYFRAME display does not show you where you are in the modify channel; it shows only the active channel status.

There are three possible cases when you are working with an active and a modify channel:

Case #1: You are on a key frame in the active channel and also on a key frame in the modify channel(s).
Case #2: You are on a key frame in one channel but not on a key frame in the other channel.
Case #3: You are not on a key frame in either channel.

You will learn how to use all of these cases as you continue to build your current effect.

9
DELEGATION

CH 1

then

GOTO KF

then

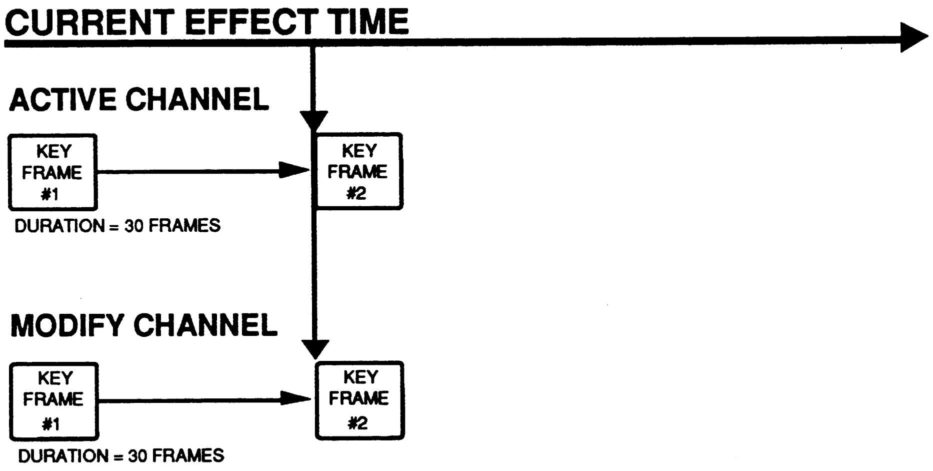
2

then

ENTER

9. **Case #1:** Delegate the panel to [CH 1]. Go to Key Frame # 2 of Channel 1; the KEYFRAME display will show "2."

NOTE: *If you followed Steps 1-8, you will also be on Key Frame #2 of the Global channel, since it occurs at the same time. If you want to check this, select [GLOBAL]; the KEYFRAME display will now show where you are in the Global channel. Delegate the panel to [CH 1] before you continue with the lesson.*


CURRENT EFFECT TIME
ACTIVE CHANNEL
KEY FRAME #1
KEY FRAME #2
DURATION = 30 FRAMES
MODIFY CHANNEL
KEY FRAME #1
KEY FRAME #2
DURATION = 30 FRAMES

- The KEYFRAME display will show where you are in the active channel.
- The [PREV] pushbutton will be lighted. If you press it, it will take you to the previous key frame in the active channel.
- The [DELETE], [REPLCE], [INSERT BEFORE], and [INSERT AFTER] pushbuttons will be lighted. They will operate exactly as they would with a single channel. If you insert a new key frame, it will have the same duration as the key frame immediately before it in the effect.

Case #1: *You are on a key frame of the active channel and also on a key frame of the modify channel.*

10

DELEGATION

CH 1

then

Use the control panel to set up a key frame.

DELEGATION

GLOBAL

then

Use the control panel to set up a key frame.

DELEGATION

Hold down CH 1

and press

GLOBAL

then

INSERT ↓☐ BEFORE

10. To set up and enter a new key frame using both channels:
    - With the panel delegated to [CH 1], change the working key frame. These changes will use Channel 1 parameters.
    - Delegate the panel to [GLOBAL] and change the working key frame. These changes will use Global parameters.
    - Hold down [CH 1] in the DELEGATION section and press [GLOBAL]. This selects Channel 1 as the active channel and Global Control as a modify channel. The KEYFRAME pushbuttons will light to show you which operations you can select at this time. Since you are directly on a key frame in both the active and modify channels, the following pushbuttons will be lighted: [DELETE], [REPLCE], [INSERT BEFORE], and [INSERT AFTER]. These pushbuttons light only when you are on a key frame in all delegated channels, so they serve as a status indicator. The [NEXT], [PREV], [STOP NEXT], and [GO TO KF] pushbuttons will follow the active channel.
    - Press [INSERT BEFORE] to insert the picture into the current effect as Key Frame #2 on both channels. The original Key Frames #2 will now be #3 Key Frames.

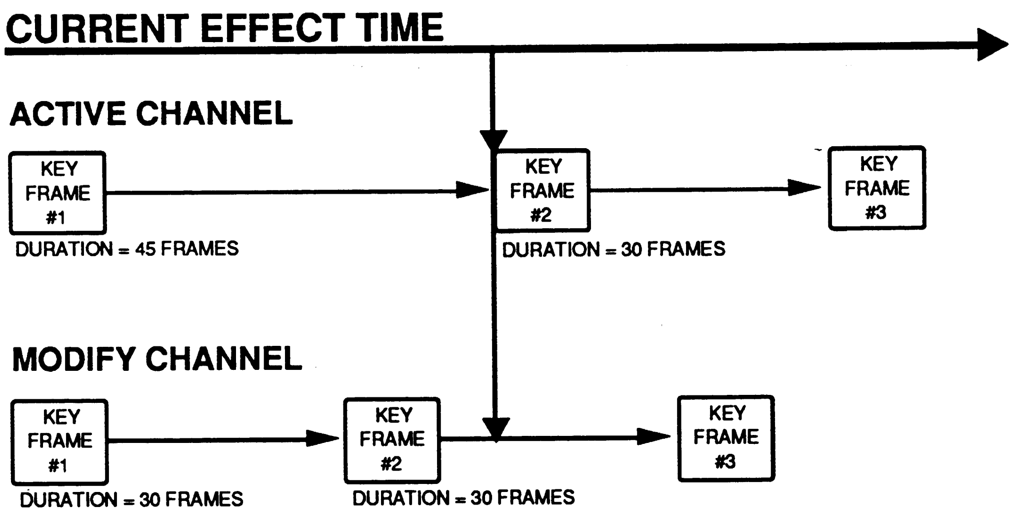
11
DELEGATION
CH 1
then
GOTO KF
1
ENTER
then
KF DUR
4 5
ENTER
REPLCE

11. **Case #2:** Delegate the panel to [CH 1]. Go to Key Frame # 1 of Channel 1. Select [KF DUR], key in 45, and press [ENTER] then [REPLCE]. This changes the duration of Channel 1's Key Frame #1 to 45 frames; the Global Key Frame #1 will remain at its original rate of 30 frames, as shown in the picture on the next page.

NOTE: *If you have a TTY terminal connected to the DPM frame, you can view the relationship of the channels in an effect in the Time Line display. In the STREAMLINE™ Main menu, select {More}, {Term}, and {Tline}.*

12
GOTO KF
2
ENTER

12. Go to Key Frame #2 of Channel 1. Key frame #2 may not look the same as when you created it, because the Global transform that you also created is now in effect.


CURRENT EFFECT TIME
ACTIVE CHANNEL
KEY FRAME #1
DURATION = 45 FRAMES
KEY FRAME #2
DURATION = 30 FRAMES
KEY FRAME #3
MODIFY CHANNEL
KEY FRAME #1
DURATION = 30 FRAMES
KEY FRAME #2
DURATION = 30 FRAMES
KEY FRAME #3

- The KEYFRAME display will show where you are in the active channel.
- The [INSERT AFTER] pushbutton will be lighted. If you press [INSERT AFTER]:
  1. Key Frame #2 on the active channel will be replaced by a new key frame;
  2. A new key frame will be inserted between Key Frame #2 and #3 in the modify channel.

  No time will be added to either channel.

***Case #2:** You are on a key frame in the active channel but not on a key frame in the modify channel.*

13

DELEGATION

CH 1

then

Use the control panel to set up a key frame.

DELEGATION

GLOBAL

then

Use the control panel to set up a key frame.

DELEGATION

Hold down CH 1

and press

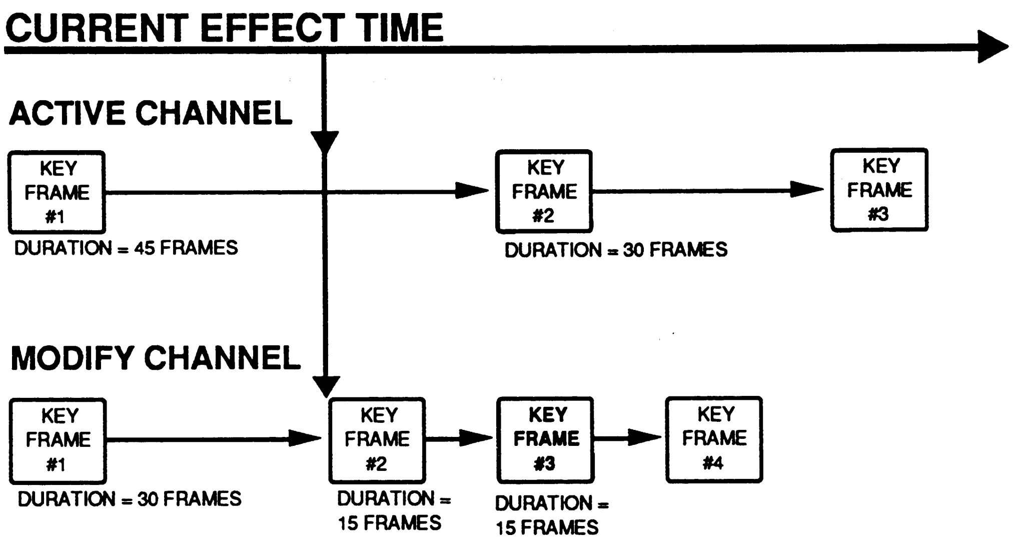
GLOBAL

then

INSERT AFTER

13. To set up and enter a new key frame using both channels:
    - With the panel delegated to [CH 1], change the Channel 1 working key frame.
    - Delegate the panel to [GLOBAL] and change the Global working key frame.
    - Hold down [CH 1] in the DELEGATION section and press [GLOBAL]. The KEY-FRAME pushbuttons will light to show you which operations you can select at this time. Since you are not on a key frame in the modify channel, only the [INSERT AFTER] pushbutton will light.
    - Press [INSERT AFTER]. The picture will replace Key Frame #2 of Channel 1 (active) and will be inserted between Key Frame #2 and Key Frame #3 of the Global (modify) channel.

ALTERNATE CASE #2

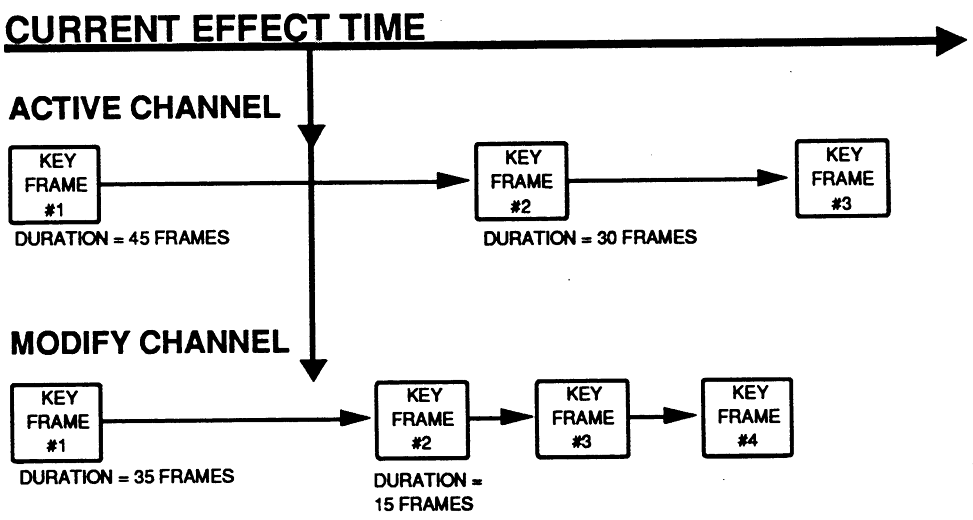

CURRENT EFFECT TIME
ACTIVE CHANNEL
KEY FRAME #1
DURATION = 45 FRAMES
KEY FRAME #2
DURATION = 30 FRAMES
KEY FRAME #3
MODIFY CHANNEL
KEY FRAME #1
DURATION = 30 FRAMES
KEY FRAME #2
DURATION = 15 FRAMES
KEY FRAME #3
DURATION = 15 FRAMES
KEY FRAME #4

- The KEYFRAME display will show where you are in the active channel.
- The [INSERT AFTER] pushbutton will be lighted. If you press [INSERT AFTER]:
    1. A new key frame will be inserted between Key Frame #1 and #2 in the active channel.
    2. Key Frame #2 on the modify channel will be replaced by a new key frame;

  No time will be added to either channel.

Alternate Case #2: *You are not on a key frame in the active channel but you are on a key frame in the modify channel.*

Case # 3 is very similar to case #2. Since you are not on a key frame of either channel, only [INSERT AFTER] will be lighted. Pressing it will insert a key frame into the effect between existing key frames, just as it did in Case #2 on the channel where you were between key frames. The display and pushbuttons will follow the active channel.


CURRENT EFFECT TIME
ACTIVE CHANNEL
KEY FRAME #1
DURATION = 45 FRAMES
KEY FRAME #2
DURATION = 30 FRAMES
KEY FRAME #3
MODIFY CHANNEL
KEY FRAME #1
DURATION = 35 FRAMES
KEY FRAME #2
DURATION = 15 FRAMES
KEY FRAME #3
KEY FRAME #4

- The KEYFRAME display will show where you are in the active channel.
- The [INSERT AFTER] pushbutton will be lighted. If you press [INSERT AFTER]:
  1. A new key frame will be inserted between Key Frame #1 and #2 in the active channel.
  2. A new key frame will be inserted between Key Frame #1 and #2 in the modify channel.

  No time will be added to either channel; the remaining key frame duration at the point of insertion will be used by the new keyframe in each channel.

***Case #3:** You are not on a key frame in either the active channel or the modify channel.*

Disabling Global Transforms

The DPM-700 has a special function, called Transform Global ({XFMGBL}), which can simplify working with multi-path effects. Turning Transform Global off automatically disables global transform operations whenever the panel is delegated to a channel, even if {GLOBAL} is also selected in the DELEGATION section.

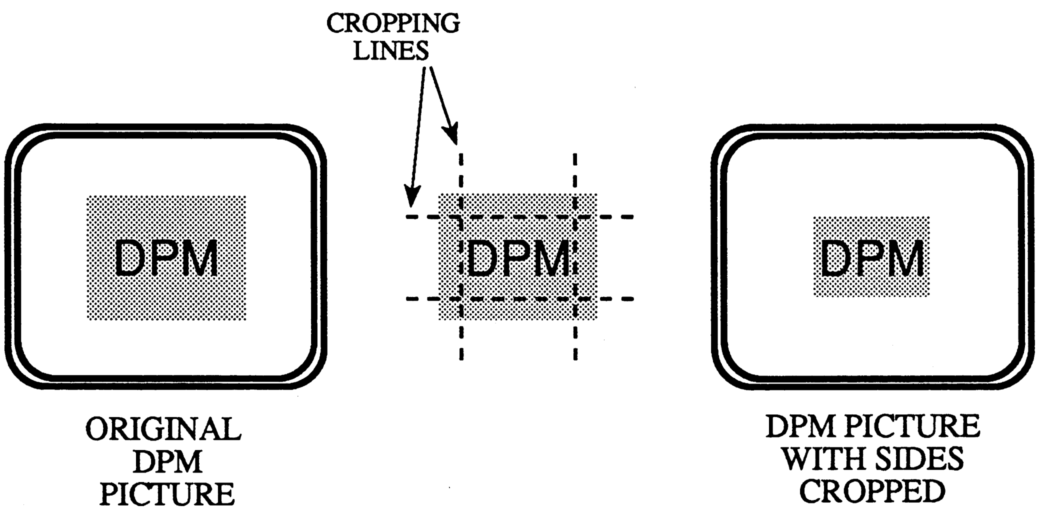
This is how it works. Consider the case where you have selected both [CH 1] and [GLOBAL] in the DELEGATION section of the panel

- In normal mode, with [XFMGBL] on, any transform functions you perform will affect both the Channel 1 transform parameters and the Global transform parameters. For example, if you moved the picture .5 units to the left, it would move .5 units as a Channel 1 transform and an additional .5 units as a Global transform.
- With [Xfmgbl] off, any transforms you perform will affect only the delegated channels. if you moved the picture .5 units to the left, it would move .5 units as a Channel 1 transform; the Global location parameters would not change. In order to perform a global transform with {Xfmgbl} off, you would need to delegate the panel to [GLOBAL] by itself, with neither channel selected.

To turn Global Transform mode on or off, select {Person} from the Home Menu, then select {Modes}. {XFMGBL} is on when the word appears in all capital letters. It will be on in default mode, as when the system is first powered up. This feature is useful with recursive memory, montage, or other parameters that require Global delegation but not global transforms.

LESSON 2-20:
CROPPING THE SIDES OF A PICTURE

You can crop (cut off) one or more sides of any DPM-700 picture. This is useful for revealing and framing the source when you only want part of the picture to show in the finished video.


CROPPING
LINES
DPM
DPM
DPM
ORIGINAL
DPM
PICTURE
DPM PICTURE
WITH SIDES
CROPPED

Crop Adjustments: *You can use Operator Crop to individually crop one or more edges of the working key frame picture.*

The DPM-700 has two ways you can adjust crop.

- Setup Crop is a system setup function which affects the input video pictures on both channels identically and at all times.

  Setup Crop adjustments are made using the {Eng} menu and are stored as part of the DPM-700's personality setup; they cannot be stored in key frames. Setup Crop is normally set during installation and never adjusted by the operator. Instructions are located in the DPM-700 Service Manual Installation section.

- Operator Crop adjustment allows you to adjust the crop on each picture separately, using the {Border} menu. This adjustment can be stored in key frames, which in turn can be stored into E-MEM® registers and onto disks. Crop is stored on a per channel basis, which means that the panel should be delegated to either Channel 1 and/or Channel 2 whenever you store an Operator Crop setting.

NOTE: *The cropping functions are always active, but the effect is not visible until you adjust the settings. That is, the default value for cropping is 0 on all sides, so the effect is not visible.*

Before beginning this lesson, make the DPM-700 picture (the working key frame) full size or smaller so that you will be able to see the cropping effect.

Operator Crop Adjustments

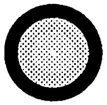
NOTE: (1) Operator Crop settings are only visible when they are larger than Setup Crop. For example, if you adjust the right side of the picture so that Setup Crop = 3.50 (.5 picture unit) and Operator Crop = 3.70 (.3 picture unit), the 3.70 Operator value will have no visible effect on the picture. The two crop settings are not added together.

(2) EZCube, described later in this manual, may produce undesired results if crops are not symetrical.

1
DELEGATION
CH 1
then
Border
then
Crop

1. Delegate the panel to [CH 1]. Select {Border} and then {Crop} from the STREAMLINE™ Home Menu. Remember that Operator Crop adjustments affect only the current working key frame picture(s).

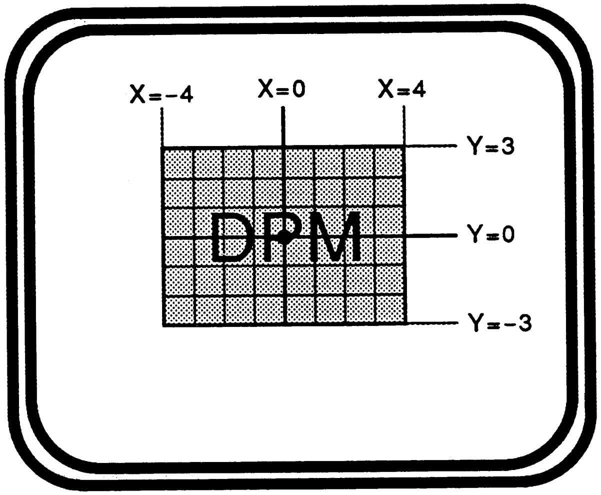
2
All
then


STREAMLINE™
SOFT KNOB

2. A new menu will appear which lets you select each side of the picture separately for cropping—{Left}, {Right}, {Top}, or {Bottom}—or lets you adjust all four sides at once using {All}.

   For this tutorial, select {All}. The word "All" will appear in the upper right-hand corner of the display to show that the STREAMLINE™ soft knob has been delegated to adjust cropping for all four sides of the picture at once, by equal amounts. Turn the soft knob clockwise and the working key frame picture will be cropped on all four sides.

As you make the adjustment, the DIRECT ENTRY display shows a value that represents where the right-side crop line falls in relationship to the center of the picture, as shown in the drawing below.

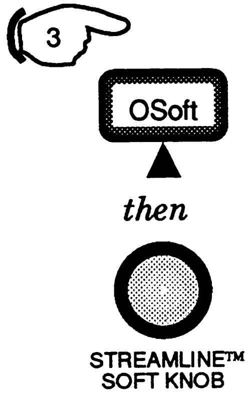


HORIZONTAL CROP (LEFT AND RIGHT):
1 UNIT = 1/8 OF THE TOTAL PICTURE WIDTH.
VERTICAL CROP (TOP AND BOTTOM):
1 UNIT = 1/6 OF THE TOTAL PICTURE HEIGHT.

Entering Crop Values: *Operator crop adjustments are made in "picture units" which show where the crop line falls in relationship to the center of the picture. The center value is designated as 0, 0. The left side is at -4 and the right side at (+)4. The top is at (+)3 and the bottom is at -3.*

Adjust the crop for all sides to be .7 picture units by setting the value to be 3.30. The right-side value is displayed. (The other three sides will be adjusted by the same amount. If you select the {Left} pushbutton, the display will now read "-3.30;" {Top} will read "2.30;" {Bottom} will read "-2.30.")

Enter this crop effect into your current effect as a key frame.



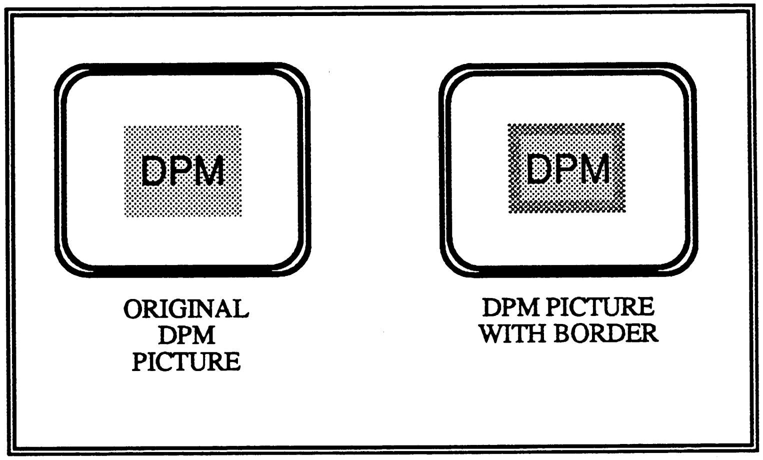
3. The same menu that you just used to adjust Operator Crop also lets you adjust the softness of the cropped edges of the working key frame picture.

   Select {OSoft}; the word "OSoft" will appear in the upper right-hand corner of the display to show that the soft knob has been delegated to the cropping the outer edge softness function. Turn the knob clockwise to increase the amount of softness and counterclockwise to decrease it. The DIRECT ENTRY display will show the current percentage of softness from none (0%) to maximum (100%).

   Enter this soft cropped edge effect into your current effect. When you run the effect, you will see the cropped edge's softness change between key frames.

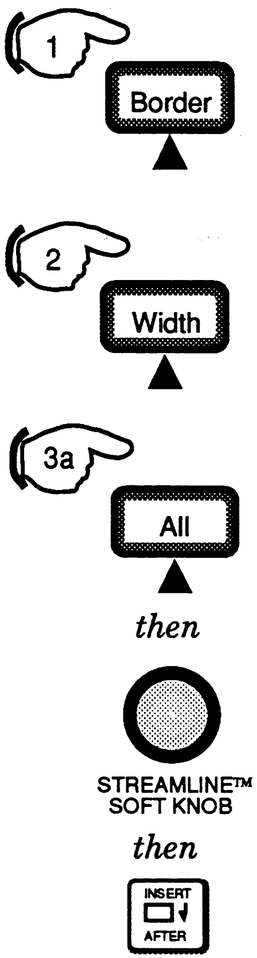
LESSON 2-21:
PLACING A BORDER AROUND A PICTURE

You can place a rectangular border on the outside edge of any DPM-700 picture (the border will be inside any cropping you have done). Note that the border will actually replace the outer edges of the picture, as shown below. You can adjust the width, color, inner and outer edge softness, and edge shape of the border.



Before beginning this lesson, make the DPM-700 picture (the working key frame) full size or smaller so that you will be able to see the border effect.

NOTE: *The border function is always active, but the border is not visible until you adjust width. That is, the border's default state is width = 0 on all sides, so it is not visible.*



1. Select {Border} from the STREAMLINE™ Home Menu.

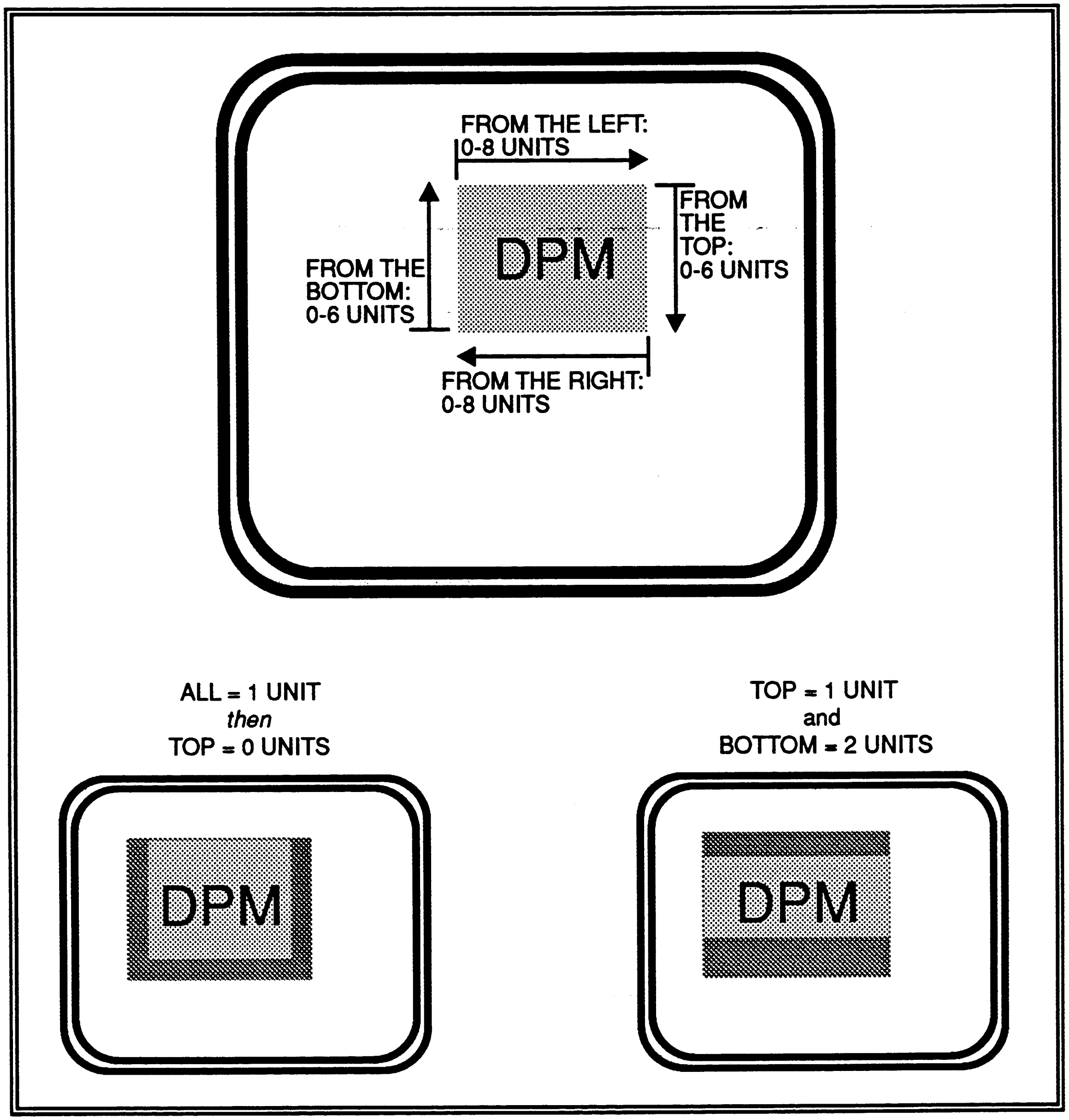
2. Select {Width}. A new menu will appear which lets you select each side of the picture separately for border width adjustment—{Left}, {Right}, {Top}, or {Bottom}—or lets you adjust all four sides at once—{All}. Another selection, {isoft}, lets you adjust the border edge softness.

3. Adjust the border width.

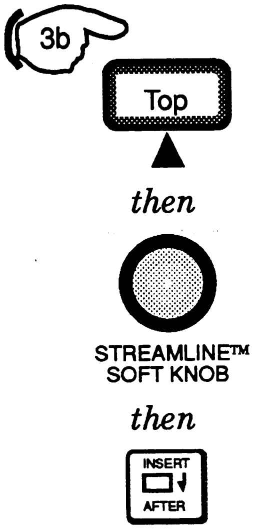
   a. For this tutorial, first select {All}. The word "All" will appear in the upper right-hand corner of the display to show that the STREAMLINE™ soft knob has been delegated to adjust the border width of all four sides of the border. Turn the soft knob clockwise and the border on the working key frame picture will widen on all four sides. At the same time, the DIRECT ENTRY display will show the border width in "picture units" which represent a proportion of the entire DPM-700 picture. Since the picture is six units high and eight units wide, each picture unit is equal to 1/6 of the entire picture height when you adjust the border at top or bottom, or to 1/8 of the entire picture width when you adjust the border on the left or right sides.

      Press [INSERT AFTER] to enter this border effect into your current effect as a key frame.

NOTE*: If the four sides are different widths, the display will show the width of the right side.*

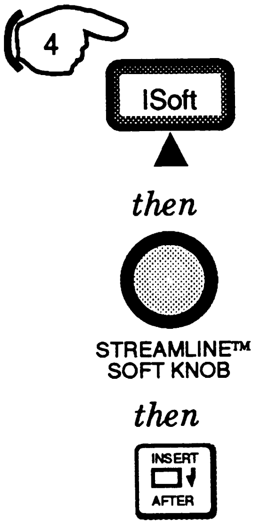

FROM THE LEFT:
0-8 UNITS
FROM THE TOP:
0-6 UNITS
FROM THE BOTTOM:
0-6 UNITS
DPM
FROM THE RIGHT:
0-8 UNITS
ALL = 1 UNIT
then
TOP = 0 UNITS
DPM
TOP = 1 UNIT
and
BOTTOM = 2 UNITS
DPM

Border Width Adjustment: *Border width is adjusted in "picture units" which represent a fixed proportion of the entire DPM-700 picture. For {Top} and {Bottom}, each picture unit equals 1/6 of the picture height; for {Left} and {Right}, each picture unit equals 1/8 of the picture width.*



b. Select {Top}. The word "Top" will appear in the upper right-hand corner of the display to show that the soft knob has been delegated to adjust the border width of the top side of the border. Turn the soft knob counterclockwise; the top part of the border will become thinner and will eventually disappear entirely. The DIRECT ENTRY display will show the width of the top border as it changes.

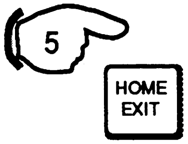
Use [INSERT AFTER] to enter this border effect into your current effect after the key frame described in Step 3.a. When you run the effect, you will see the border change between key frames.



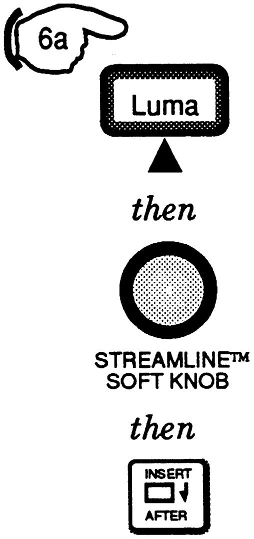
4. The same menu that you just used to adjust border width also lets you adjust the softness of the border's inner edges. Select {isoft}; the word "ISoft" will appear in the corner of the display to show that the knob has been delegated to the border inner edge softness function. Turn the knob clockwise to increase the amount of softness and counterclockwise to decrease it. The DIRECT ENTRY display will show the current percentage of softness from none (0%) to maximum (100%).

   Inner and outer softness can be adjusted using the {ISoft} and {OSoft} selections in the {Edge} branch of the {Border} menu.

   Use [INSERT AFTER] to insert this effect into your current effect after the key frame you set up in Step 3b. When you run the effect, you will see the border's edge softness change between key frames.



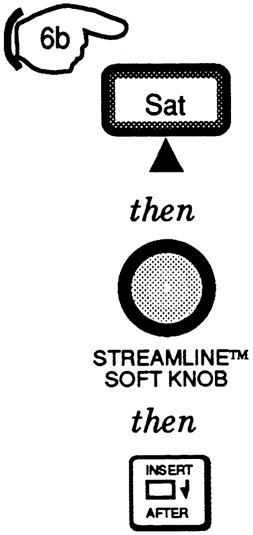
5. Press [HOME/EXIT] once to exit the border width/softness menu. This will take you to the menu one level higher where you can select and adjust the border matte color.



6. You can adjust the border luminance, saturation, and hue separately.

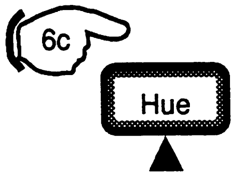
   a. Luminance is the border color brightness. To adjust luminance, select {Luma}. The word "Luma" will appear in the upper right-hand corner of the display to show that the STREAMLINE™ soft knob has been delegated to the luminance function. Turn the knob clockwise and the color luminance will increase. The DIRECT ENTRY display will show the current percentage of luminance, ranging from none (0%) to maximum (100%).

      Use [INSERT AFTER] to enter this luminance effect into your current effect after the key frame described in Step 4. When you run the effect, you will see the brightness of the border color change between key frames.

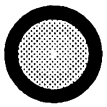


   b. Saturation refers to the amount of chroma in the color. To adjust the border color saturation, select {Sat}. The word "Sat" will appear in the upper right-hand corner of the display to show that the STREAMLINE™ soft knob has been delegated to adjust saturation. Turn the knob clockwise and the color saturation will increase. The DIRECT ENTRY display will show the current percentage of saturation, ranging from none (0%) to maximum (100%).

Use [INSERT AFTER] to enter this saturation effect into your current effect after the key frame described in Step 6a. When you run the effect, you will see the amount of chroma in the border color change between key frames.



then



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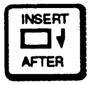
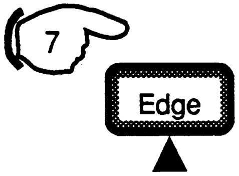
then



c. Hue refers to the shade of the color. For example, a color may be perceived as red or blue or green; this is its hue. To adjust the border color hue, select {Hue}. The word "Hue" will appear in the upper right-hand corner of the display to show that the STREAMLINE™ soft knob has been delegated to hue. Note that you will have to have Sat to see Hue. Turn the knob either direction and the hue will change. As you turn the knob, hue will run through its entire range of color tints in turn.

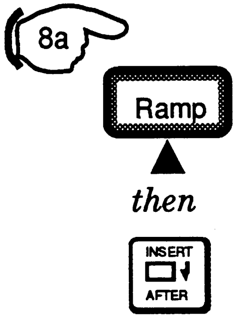
Hue is specified by phase relative to color burst. The DIRECT ENTRY display will show the current hue in degrees, ranging from 0° through 360°.

Use [INSERT AFTER] to enter this hue effect into your current effect after the key frame described in Step 6b. When you run the effect, you will see the hue of the border color change between key frames.

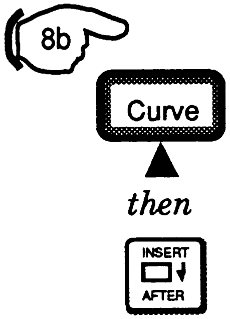


7. Press {Edge}. A new menu will appear which allows you to adjust the border edges and corners (the border edge must be soft for you to see these effects). You can select between a ramped (linear) or curved inner edge for the border. You can also select either round or beveled corners.

8. The border's inner edge can be produced according to a ramped or a curved pattern.
   - {Ramp} produces an inner edge which changes in a ramped or linear pattern.
   - {Curve} is the default; it produces an inner edge which changes in a curved pattern, producing a softer effect.

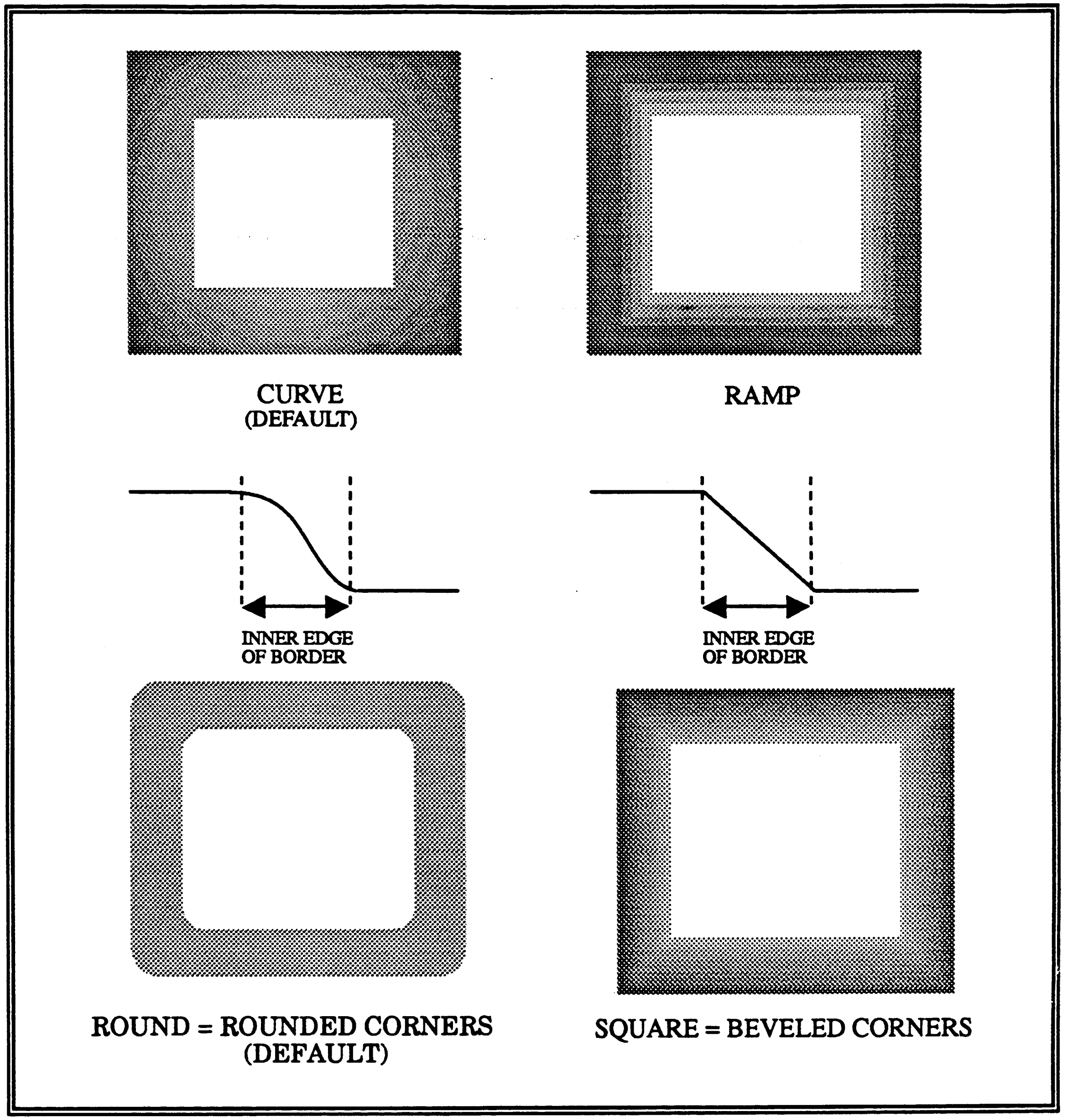


   a. For this tutorial, first select {Ramp}; the word will appear in all capital letters—{RAMP}—to show that it is selected. Press [INSERT AFTER] to enter the effect as a key frame in your current effect.



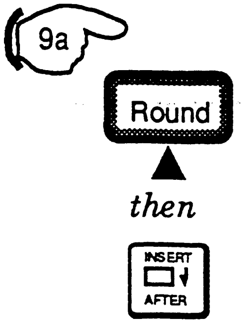
   b. Next, select {Curve} (it will appear in capital letters). Use [INSERT AFTER] to enter this new key frame immediately after the ramp key frame. When you run the effect, you will see the inner edge of the border change between key frames.

NOTE: *The change is not gradual, but occurs suddenly as the effect arrives at the next key frame.*

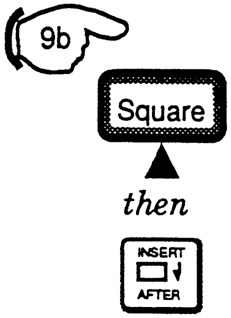

CURVE
(DEFAULT)
RAMP
INNER EDGE
OF BORDER
INNER EDGE
OF BORDER
ROUND = ROUNDED CORNERS
(DEFAULT)
SQUARE = BEVELED CORNERS

Border Edges And Corners: *Border edges can be linear (ramped) or curved. Border corners can be rounded or squared (beveled).*

9. The border's corners can be either rounded or beveled.
   - {Round} is the default; it produces a rounded corner.
   - {Square} produces a corner which appears slightly three dimensional, as if the corner edges sloped inward. This is most effective when combined with the ramped inner edge. The corner will be square instead of rounded.



   a. For this tutorial, first select {Round}; the word will appear in all capital letters—{ROUND}—to show that it is selected. Press [INSERT AFTER] to enter the effect as a key frame in your current effect.



   b. Next select {Square} (it will appear in capital letters) and use [INSERT AFTER] to enter this new key frame immediately after the round-cornered key frame. When you run the effect, you will see the corners of the border change suddenly at the second key frame.

LESSON 2-22:
PICTURE COLOR EFFECTS

The DPM-700 has several functions which modify picture focus and colors in interesting ways and make it easy for you to create intricate effects.

- Defocus blurs the picture and produces a softened, out-of-focus effect.
- Posterization produces an effect similar to a painting or poster by reducing the number of different luminance quantization levels. For example, adjacent brightness levels in the original picture may appear as one level after posterization. The many different luminance levels in a picture can be converted to as few as three levels.
- Solarization is an effect in which the number of chrominance levels are reduced in the same way as the luminance levels in Posterization.
- Separate color value controls allow you to adjust a color's saturation or hue, to falsely colorize a picture.

CAUTION
Using these video effects may produce a composite signal which exceeds allowable transmission levels or a component signal which is out of specification.

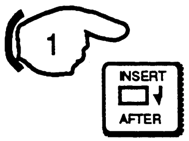
- Luma gain {LGain} controls luminance of the original picture—from full luminance to inverted luminance.
- Chroma gain {CGain} controls the level of chromanance of the original picture—from full chroma to inverted chroma.

NOTE: *Before beginning this lesson, set the system to its default state by deleting the current effect and clearing the working key frames as follows:*

- *In the DELEGATION section, press* [CH 1], [CH 2], *and* [GLOBAL] *at the same time.*
- *In the KEYFRAME section, press and hold [CLEAR WORKING KF] for one second.*
- *In the E-MEM® EFFECTS MEMORY section:, select* [RECALL TO CUR EFF]. *Be sure Recall 1,2, Global are lit then press* [BANK], [0], [0].

If the selected channel's video doesn't appear full screen (not manipulated or transformed) the Default Keyframe should be set by a qualified person. The setup selections are shown in the Personality {Person} menu tree in the Dictionary of Controls section of this manual.

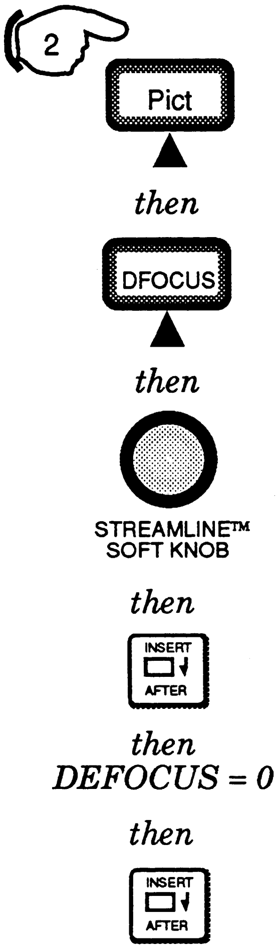
When you are finished, delegate the panel to Channel 1.



1. Press [INSERT AFTER] to begin this effect with a key frame set to its default values.

Defocus Effect

The Defocus function blurs the picture and produces a softened, out-of-focus effect.



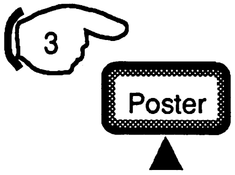
2. Select {Pict} from the STREAMLINE™ Home Menu. A new menu will appear which contains a {DFOCUS} selection. However, the default value is 0% and the effect is not visible until the value is adjusted.

   Press {DFOCUS} to delegate the soft knob to the Defocus function; the word "Dfocus" will appear in the upper right-hand corner of the display. Turn the knob to adjust the amount of defocus effect. The range is from 0-100%, with 100% producing maximum blurring. For this lesson, set the defocus value to 60%.

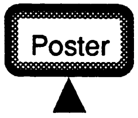
   Defocus is stored per channel. Use [INSERT AFTER] to enter this Defocus effect into your current effect as Key Frame #2. When you run the effect, you will see the picture blur as it moves from Key Frame #1 to #2.

   To remove all Defocus effect from the working key frame, use the soft knob to set the value to 0%. Insert this working key frame as Key Frame #3. (To remove Defocus from a stored key frame, go to that key frame, set Defocus to 0%, and replace the key frame.)

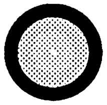
Posterization Effect



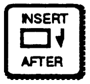
then



then



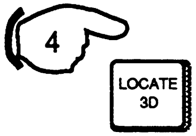
then



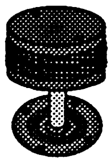
3. Select {Poster} from the {Pict} menu. A new menu will appear which lets you select either posterization or solarization to modify the colors of the DPM-700 picture.

   Select {Poster} again; this delegates the soft knob to posterization. Turn the knob to adjust the number of luminance quantizing levels. The adjustment range, as shown in the display, is from 0% to 100%. At the maximum setting of 100%, you will have only three different levels of luminance.

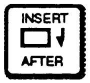
   Posterization is stored per channel. Press the [INSERT AFTER] pushbutton to enter this posterization effect into your current effect as Key Frame #4.



then

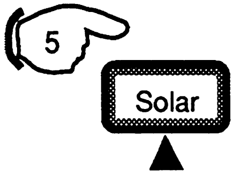


then
POSTER = 0
then

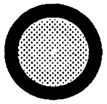


4. Move the picture to a different location. Set the {Poster} value back to 0 and press [INSERT AFTER] to insert Key Frame #5. When you run the effect, you will see the number of luminance levels change between Key Frames #3, #4, and #5.

Solarization Effect

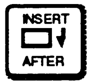


then



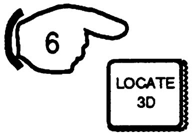
STREAMLINE™
SOFT KNOB

then

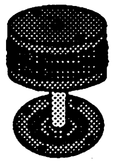


5. Select {Solar}; this will delegate the soft knob to the solarization effect. Turn the knob to reduce the number of chrominance values in the video. As you turn the knob, the adjacent chrominance values will combine producing less varied coloring in the video picture.

   Solarization is stored per channel. Press the [INSERT AFTER] pushbutton to enter this solarization effect into your current effect as Key Frame #6.

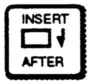


then



then
SOLAR = 0

then

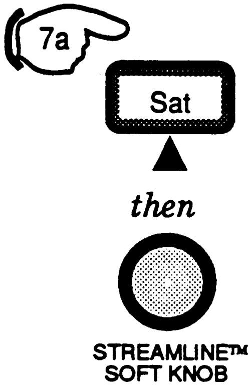


6. Move the picture to a different location. Set the {Solar} value back to 0 and press [INSERT AFTER] to insert Key Frame #7. When you run the effect, you will see the number of chrominance values reduce between Key Frames #5 and #6, and then return between #6 and #7.

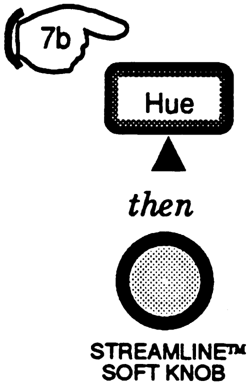
NOTE: *Some pictures without much variety in chromanance will not show a large difference in solarization.*

Color Value Controls

7. You can add a false color across the entire picture as follows:



   a. Press [HOME/EXIT] and select {Sat}. Use the soft knob to adjust the picture saturation (the amount of offset). The DIRECT ENTRY display will show the current percentage of saturation, ranging from none (0%) to maximum (100%).

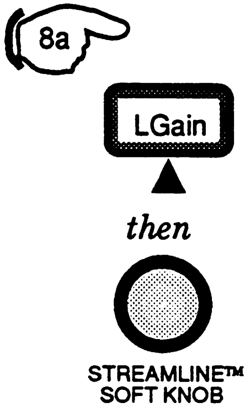


   b. Select {Hue}. Use the soft knob to adjust the overall tint of the picture color. (You may have to adjust the saturation in order to see the change.)

   The DIRECT ENTRY display will show a number from 0 to 360. The numbers represent the different hues: blue, cyan, green, yellow, red, and magenta.

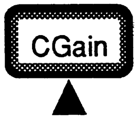
Chrominance and Luminance Gain Controls

8. You can adjust chrominance and luminance channel gain as follows:

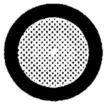


   a. Select {LGain}. Use the soft knob to adjust the channel luminance gain. The adjustment range is from 1.0 (full color) to 0.0 (colors very dim) to -1.0 (luminance reversed). The DIRECT ENTRY display will show the current value.

8b



then

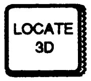


STREAMLINE™
SOFT KNOB

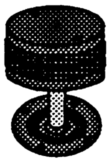
b. Select {CGain}. Use the soft knob to adjust the channel chroma gain. The adjustment range is from 1.0 (full color) to 0.0 (black and white) to -1.0 (colors are reversed to their complements; for example, green becomes violet). The DIRECT ENTRY display will show the current value.

False color effects are stored per channel. Use the [INSERT AFTER] pushbutton to enter this false color effect into your current effect as Key Frame #8.

8c

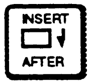


then



then
SAT = 0
HUE = 0
LGAIN = 1
CGAIN = 1

then



c. Move the picture to a different location. Set all color values back to normal ({SAT} = 0; {HUE} = 0; {LGAIN} = 1; {CGAIN} = 1) and press [INSERT AFTER] to insert the working key frame as Key Frame #9. When you run the effect, you will see the color values change between Key Frames #7 and #8, and then change back to normal between Key Frames #8 and #9.

LESSON 2-23: SPECIAL EFFECTS

The DPM-700 can manipulate a picture in order to produce the following special effects:

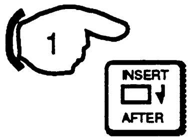
- Mosaic is an effect which visually breaks up the picture into small rectangles or tiles.
- Motion lets you select either field or frame storage for freeze and recursive effects.
- Freeze stops the motion of a video input picture and lets you manipulate it as a still picture.
- EZCube is a function used to automatically place the correct video on the sides of a rotating cube as each new side appears.
- Depth mode can be used to override normal Combiner priority and assign priority according to which picture is closest to the eye in 3D space.

NOTE: *Before beginning this lesson, set the system to its default state by deleting the current effect and clearing the working key frames as follows:*

- *In the DELEGATION section, press* [CH 1], [CH 2], *and* [GLOBAL] *at the same time.*
- *In the KEYFRAME section, press and hold [CLEAR WORKING KF] for one second.*
- *In the E-MEM® EFFECTS MEMORY section:, select* [RECALL TO CUR EFF]. *If all three recall pushbuttons are not lit, hold down* [RECALL CH 1] *for 1/2 second to select all three recall pushbuttons, then press* [BANK], [0], [0].

If the selected channel's video doesn't appear full screen (not manipulated or transformed) the Default Keyframe should be set by a qualified person. The setup selections are shown in the Personality {Person} menu tree in the Dictionary of Controls section of this manual.

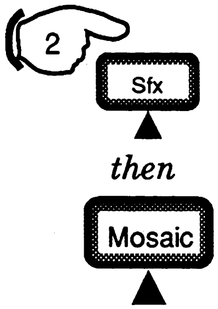
When you are finished, delegate the panel to Channel 1



1. Press [INSERT AFTER] to begin the next effect with a key frame set to its default values.

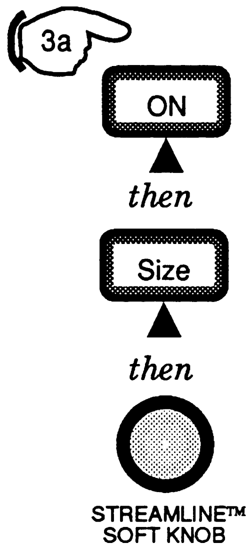
Mosaic Effect

The mosaic effect makes the picture look as if it were made up of many small rectangles or tiles, as shown in the picture on the following page. Each tile is a single, solid color; the color used is the color of the pixel in the upper lefthand corner of the tile area. In effect, this reduces the resolution of the original picture.

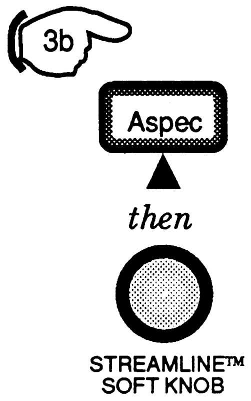


2. In the top level menu press {Sfx} and select {Mosaic}.

3. A new menu will appear which allows you to adjust the size and aspect ratio of the tiles.

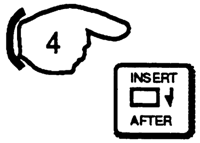


   a. Press {On}, then press {Size} and use the soft knob to adjust the size of the individual tiles.

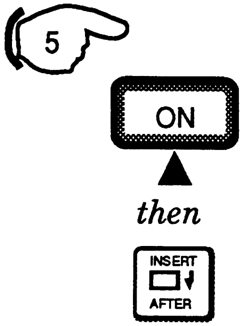


   b. Press {Aspec} and use the soft knob to adjust the aspect ratio (the height versus the width) of the tiles.

NOTE: *You may want to crop the picture in order to get rid of the black tiles which appear on the left side and top. Adjustment of crops was described in lesson 2-20.*

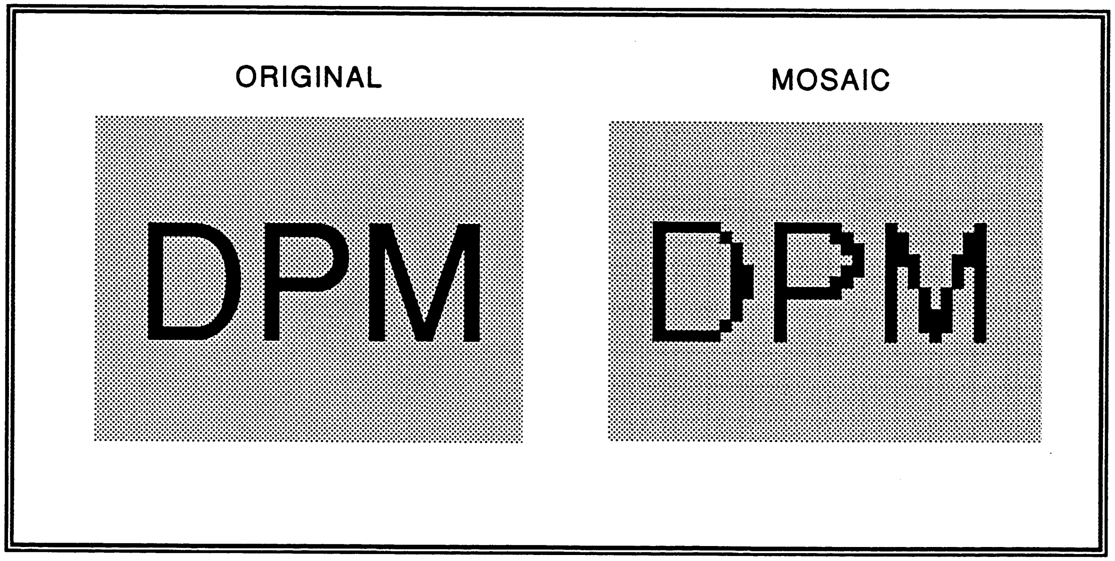

4
INSERT
AFTER

4. Mosaic effects are stored per channel. Use [INSERT AFTER] to enter this mosaic effect into your current effect as Key Frame #2.


5
ON
then
INSERT
AFTER

5. Press {ON} again to turn off the Mosaic effect (the word should appear in lowercase "n").

   Press [INSERT AFTER] to insert this working key frame as Key Frame #3. When you run the effect, you will see the picture change into mosaic tiles at Key Frame #2, and revert to normal at Key Frame #3.

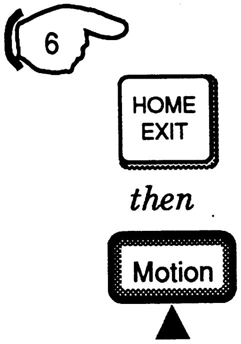

ORIGINAL
MOSAIC
DPM
DPM

Mosaic: *The picture appears to be made up of small tiles.*

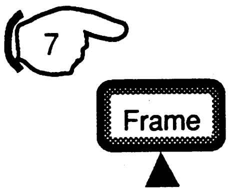
Freeze: Field Storage and Frame Storage

You can select either field storage or frame storage for freeze and recursive functions, as follows:

- Field storage freezes a single field and displays it twice to create a frame. Because the same field is displayed twice instead of two different fields, the effect will be more stable than frame storage, but it may be slightly less sharp.
- Frame storage freezes both fields of a frame. Because the two different fields are displayed at the same time, the effect will be sharper and more detailed than field storage, but it may be less stable. Frame storage is good for non-moving pictures, such as words or characters.



6. Press [HOME/EXIT] to return to the {Sfx} menu. Select {Motion}.



7. A new menu will appear which allows you to select field storage {Field} or frame storage {Frame}. For this lesson, select {Frame} storage.

Field/Frame Transition

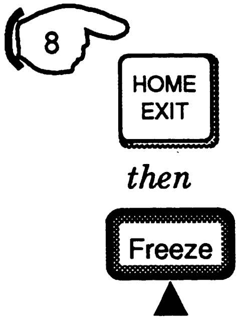
The channels of the DPM-700 manipulate their images on a field-by-field basis. This can cause problems in recursive memory such as having the DPM move a picture during the one-frame-long recursive strobe. This produces a jittering picture in the recursed image. Switching the channel to frame transition corrects this problem by forcing the channel to wait for one full frame while the image is strobed into the recursive memory system.

NOTE: *The transition mode is NOT adjustable in the Global channel.*

Freeze

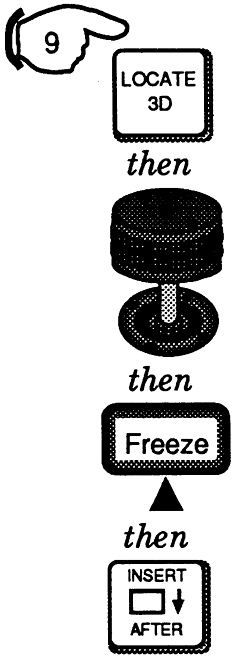
The {Freeze} function allows you to stop the motion of a moving video input picture. That is, you can freeze the input picture at any point in time and then use the DPM-700 to manipulate it as a still picture.

***NOTE:** The actual input source is not affected by a freeze operation; the input source picture continues to move. This means that if you insert a key frame into your current effect with {FREEZE} on and then run the effect, it will apply the key frame's stored freeze parameters to the input source picture at that moment in time.*



8. Press [HOME/EXIT] to return to the top-level {Sfx} Menu. Press {Freeze} and the input picture will be frozen at that point in time; the word {FREEZE} will appear in all capital letters to show that it is selected.

   Freeze is stored per channel. Use [INSERT AFTER] to enter this freeze effect into your current effect as Key Frame #4 for Channel 1.

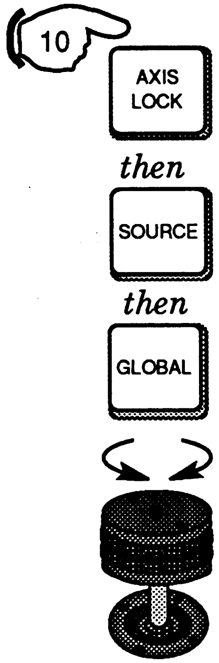


9. Move the picture to a different location. Press {FREEZE} again to turn the freeze function off and press [INSERT AFTER] to insert Key Frame #5. When you run the effect, you will see the Channel 1 picture freeze for the duration of Key Frame #4.

NOTE: *Mosaic, border, posterization, solarization, and defocus effects will be frozen when the picture is frozen but crops can be used.*

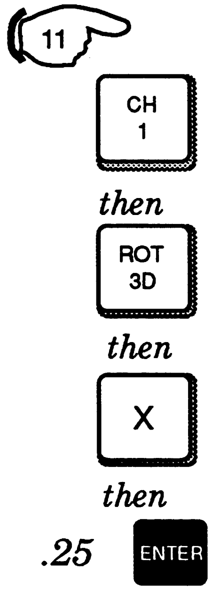
EZCube

EZCube is a specialized function which simplifies creating a rotating cube effect. The effect requires a two-channel system or multiple passes.

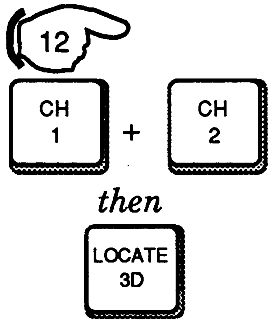


10. Start with both channels at unity size and zero transforms with [CLEAR WORKNG KF]. [AXIS LOCK] must be on and [SOURCE] must be on.

    Delegate [GLOBAL] and move the Global channel away from the viewer on the Z axis, so that the picture appears small enough to build a cube within the screen boundaries.

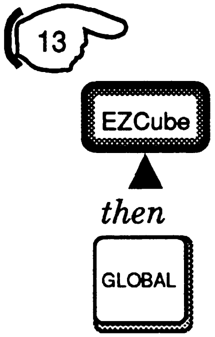


11. Delegate [CH1], and select [ROT 3D] in the TRANSFORM section. Select [X] and key in ".25" in the DIRECT ENTRY section and [ENTER]. This will rotate channel 1 to X = +.25 (1/4 turn), making it barely visible with an edge view.



12. Delegate [CH1] and [CH2] with [SOURCE] on. Select [LOCATE 3D].

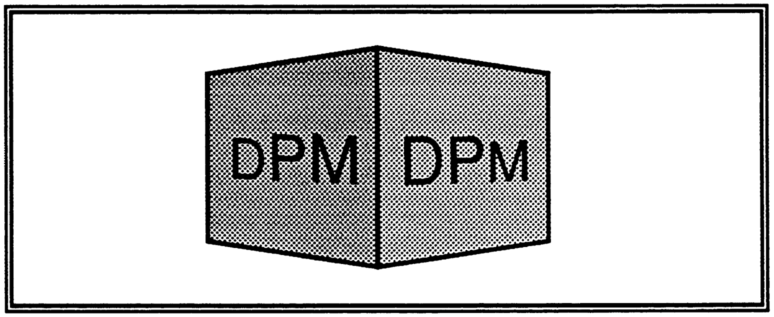
    Locate both pictures along their Z axes (do not move X or Y) so that channel 1 moves to the right corner of channel 2 and their edges meet. (The amount of setup crop could produce a gap for detented locations.)



13. Enable {EZCUBE} in the {Sfx} menu and select [GLOBAL] in the DELEGATION section.

Next, use Spin or Rotate to rotate the cube in the global X direction. With EZCube on, the correct video will be assigned to each new side of the cube automatically, as it comes into view (the old side will disappear at the same moment).

To turn EZCube on or off, select {Sfx} from the Home Menu, then select {EZCube}. The function is on when the word appears in all capital letters.



Depth

Depth mode is a special operational mode which is used in two-channel systems. It overrides normal Combiner priority and instead assigns priority according to which picture should appear closest to the eye in 3D space, as follows:

- In Combiner mode, the Combiner selects priority (which channel will appear in front of the other) according to the control panel set-up. That is, it will show either Channel 1 or Channel 2 in front of the other according to the current Combiner transition state. (The "Using the Optional Second Channel" lesson in the Advanced Effects section of this manual explains Combiner transitions in more detail.)
- When {Depth} is on, the system will use the pictures' relative Z location values to determine which one should appear in front; that is, the channel picture with the Z value which places it closest to the viewer will appear in front. This will give a more realistic three-dimensional effect when one picture passes in front of the other.

To turn Depth mode on or off, select {Sfx} from the Home Menu, then select {Depth}. The function is on when the word appears in all capital letters. It will be off in default mode, as when the system is first powered up.

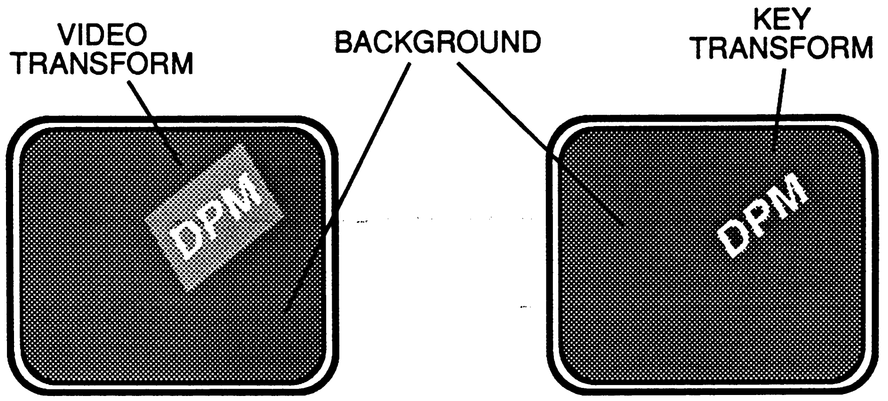
LESSON 2-24: USING KEYS

A key signal is always output at the KEY OUTPUT on the back of the frame. The key is either in the shape of the transformed DPM-700 picture (the entire raster), or its shape is determined by luminance or linear keying of an input key-source selected in the KEYER section of the control panel.

The shape of a luminance key is determined by clipping the luminance level of the video signal. Where the luminance is higher than a level determined by the CLIP control, the key signal will "cut" a hole in the background video and the fill video will be inserted there.

Creating a key requires three separate video signals:

- Background—the video that lies behind the key. If using the DPM-700 internal keyer, the background can be an external video input or an adjustable solid matte color produced by the DPM-700.
- Key source—the key signal that determines the shape of the key; that is, it "cuts" the hole for the key. The key source can be an external key signal or it can be derived from input channel video. You select a source in the KEYER section with [SELF KEY], [EXT KEY CH1], or [EXT KEY CH2].
- Fill video—the video that fills the hole cut by the key source. This can be either a channel's video, or it can be a solid matte color produced by the DPM-700.

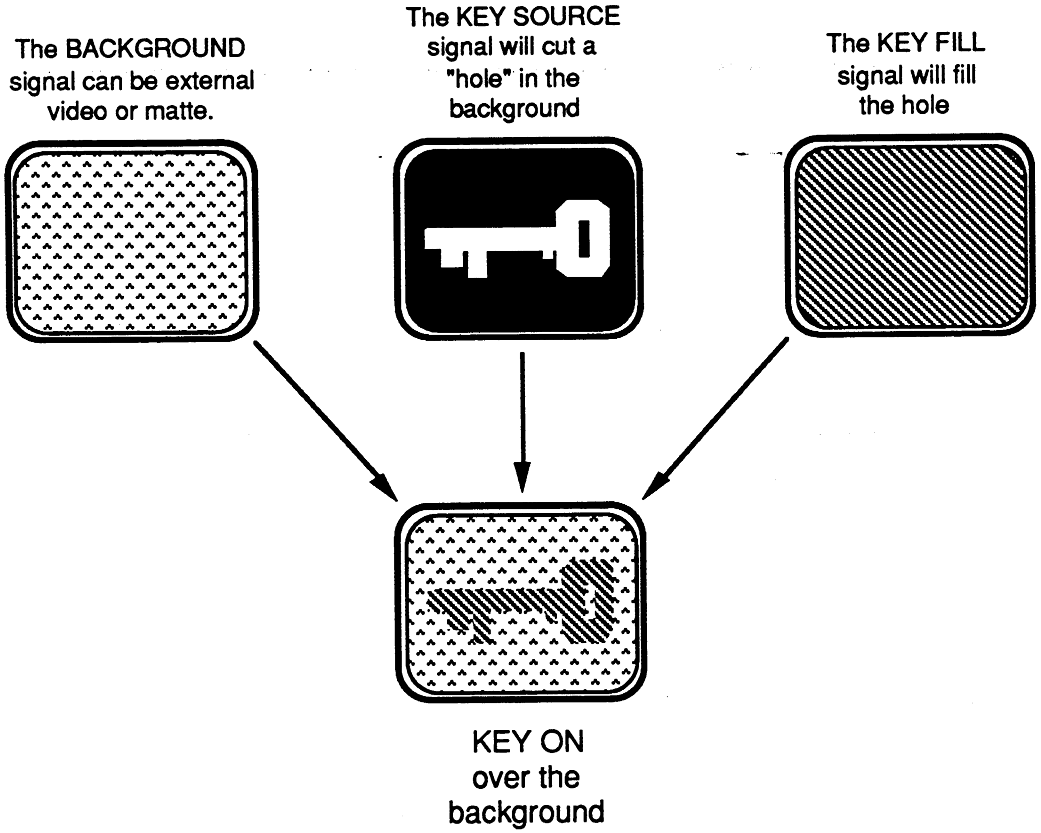


A VIDEO TRANSFORM CONSISTS OF THE MANIPULATED VIDEO PICTURE (THE ENTIRE RASTER). IT IS OUTPUT AT THE CLEAN FEED OUTPUT AND AT THE PROGRAM OUTPUT WHEN IN DOWNSTREAM MODE. THE RASTER DEFINES THE KEY SHAPE AT THE KEY OUTPUT WHEN NO INPUT KEYING IS DONE.

A KEY TRANSFORM IS A LUMINANCE OR LINEAR KEY OF THE SELECTED VIDEO SOURCE, MANIPULATED AND TRANSFORMED LIKE THE VIDEO TRANSFORM. IT IS USED TO KEY THE VIDEO OVER A BACKGROUND, AND IS OUTPUT AT THE KEY OUTPUT.

- The **KEY OUTPUT** is a black-and-white signal consisting of the white key shape inserted into a black background.
- The **CLEAN FEED OUTPUT** is a color signal consisting of the Video Transform or keyed video inserted into a matte background.
- The **PROGRAM OUTPUT** is similar to the CLEAN FEED OUTPUT. It consists of the same Video Transform or keyed video inserted into either the matte or an external analog background when downstream mode is selected.

Key Signal: *The DPM-700 can place a key over a matte or an external video background. The key signal is also available separately on the key output.*


The BACKGROUND signal can be external video or matte.
The KEY SOURCE signal will cut a "hole" in the background
The KEY FILL signal will fill the hole
KEY ON over the background

The Components Of a Key: *The key source cuts a hole in the background and the fill video fills the hole.*

Setting Up a Key

NOTE: *A DPM-700 with two channels installed actually has two separate input keyers, but they are controlled by a single KEYER control panel. Since the keyers are separate, you can set up one key on Channel 1 and a different key on Channel 2. Operation of the keyers is the same for both channels. To delegate the KEYER controls, select* [CH 1] *or* [CH 2] *in the DELEGATION section of the control panel.*

Since there is a separate keyer for each input channel, most keyer parameters are stored on a per channel basis. The downstream keyer's matte and external backgrounds are global functions and must be stored in key frames using the Global channel.

1
DELEGATION
GLOBAL

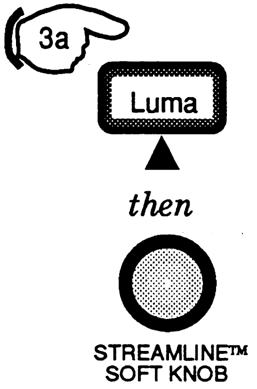
1. Select [GLOBAL] in the DELEGATION section of the control panel.

2
KEY LAYER
then
Bkgnd
then
Matte

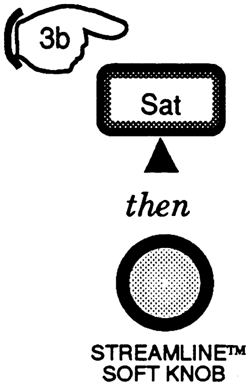
2. In downstream mode, press [KEY LAYER™]; the Key Layer menu will appear. Press {Bkgnd} and then select a key background signal for the PROGRAM output:
   - Pressing {Ext} selects the signal which is connected to the "BACKGROUND" input on the back of the DPM-700 frame as the background.
   - Selecting {Matte} gives you a solid color matte background produced by the DPM-700 matte generator.

   One of these two pushbuttons will always be selected. For this lesson, select {Matte}.

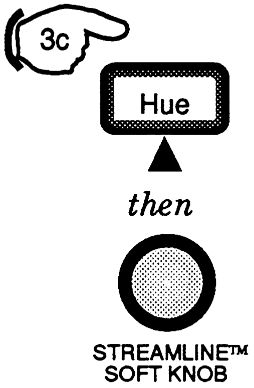
3. The {Bkngd} menu also allows you to adjust the luminance, saturation, and/or hue of the matte background color, as follows:



   a. Luminance is the brightness of the color. To adjust it, select {Luma} and the word "Luma" will appear next to the soft knob to show that it has been delegated. Turn the knob clockwise and color brightness will increase. The DIRECT ENTRY display will show the current percentage of luminance, ranging from none (0%) to maximum (100%).



   b. Saturation refers to the amount of chroma in a color; a fully saturated color has lots of color. Press {Sat} to delegate the soft knob to adjust saturation. Turn the knob. The DIRECT ENTRY display will show the current percentage of saturation, ranging from none (0%) to maximum (100%).



   c. Hue refers to the shade of a color. For example, a color may be perceived as red or blue or green; this is its hue. Press {Hue} to delegate the soft knob to adjust hue. As you turn the knob, the hue will run through its entire range of color shades.

      Hue is specified by phase relative to color burst. The DIRECT ENTRY display will show the current hue in degrees, ranging from 0° through 360°. The numbers represent the different hues: blue, cyan, green, yellow, red, and magenta.

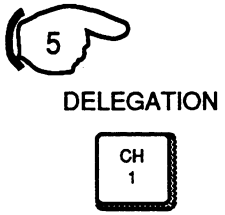
Video Shaping

The final key parameter in the {Bkgnd} menu is video shaping. This gives you the option of turning the DPM-700's video shaping function off, which you would want to do if you are keying the DPM in a switcher that has a linear keyer. This only affects the CLEAN FEED OUTPUTS. It is used when the DPM is in upstream mode.

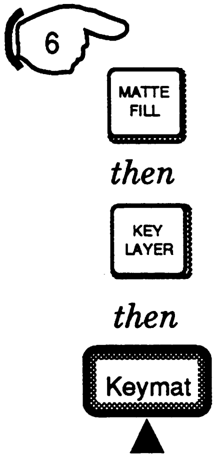
The {Shaped} pushbutton is an on/off pushbutton. When it is on, the word appears in all capital letters. Its default state is on.

Shaping in downstream mode is off with an external background selected since the DPM's keyer is a linear keyer. If an internal matte background is selected in downstream, the Clean Feed output will have shaped video over the matte.

NOTE: *Remember that background status—external or matte, color, and shaping—is stored as part of the Global channel. The panel must be delegated to* [GLOBAL] *in order to store these parameters into a key frame effect.*



5. Key fill and key source parameters are stored in key frames on a per channel basis; select [CH 1] in the DELEGATION section of the panel.



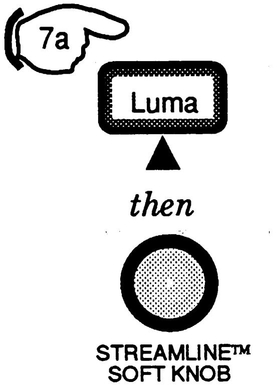
6. Select a key fill signal:
   - Selecting [MATTE FILL] in the KEYER section gives you a solid color matte fill produced by the DPM-700 matte generator. (This matte is not the same as the background matte.)
   - Turning [MATTE FILL] off automatically selects the manipulated video output from the DPM-700 as the key fill.

   For this lesson, select [MATTE FILL].

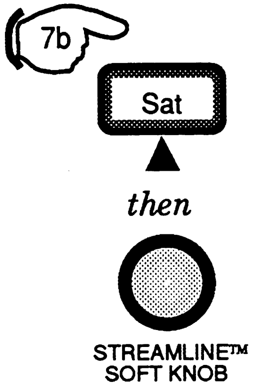
   To adjust the matte fill color, press [KEY LAYER] to bring up the Key Layer menu in the STREAMLINE™ display. Select {Keymat} to adjust the luminance, saturation, and hue of the matte fill color.

NOTE: *Background matte and key fill matte are separate from one another. They are produced by different matte generators and adjusted in different subsections of the {Key Layer} menu.*

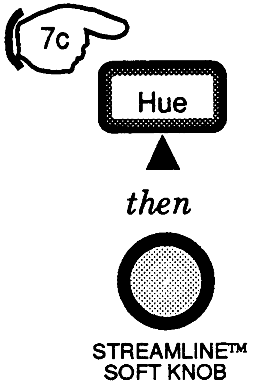
7. The {Keymat} menu allows you to adjust the luminance, saturation, and/or hue of the matte fill color, as follows:



   a. Luminance is the brightness of the color. To adjust it, select {Luma} and the word "Luma" will appear next to the soft knob to show that it has been delegated. Turn the knob clockwise and color brightness will increase. The DIRECT ENTRY display will show the current percentage of luminance, ranging from none (0%) to maximum (100%).

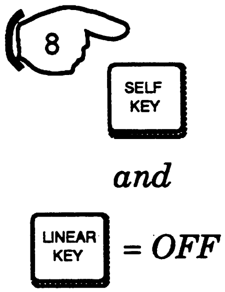


   b. Saturation refers to the amount of chroma in a color. To adjust the color saturation, select {Sat}. The word "Sat" will appear in the upper right-hand corner of the display to show that the STREAMLINE™ soft knob has been delegated to adjust saturation. Turn the knob clockwise and the color saturation will increase. The DIRECT ENTRY display will show the current percentage of saturation, ranging from none (0%) to maximum (100%).



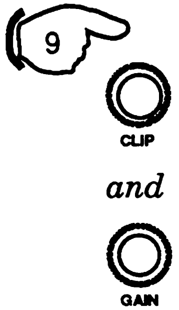
   c. Hue refers to the shade of a color. For example, a color may be perceived as red or blue or green; this is its hue. Press {Hue} to delegate the soft knob to adjust hue. As you turn the knob from one limit to the other, hue will run through its entire range of color shades.

      Hue is specified by phase relative to color burst. The DIRECT ENTRY display will show the current hue in degrees, ranging from 0° through 360°. The numbers represent the different hues: blue, cyan, green, yellow, red, and magenta.



8. Select a key source signal:
    - Select [SELF KEY] in the KEYER section if you want to set up a luminance key derived from a channel's input video or key signal. The key can be filled with the same channel's video, or with an internally generated matte using [MATTE FILL].
    - For a self key with linear keying, select [SELF KEY] and [LINEAR KEY]. A linear key is a special type of luminance key that does not shape the key signal. At unity gain, a linear key output signal will have exactly the same shape and softness as the key source input. Linear keys are used when the key signal has been pre-shaped at the source and requires no further shaping by a DPM-700 keyer.
    - Select [EXT KEY CH1] or [EXT KEY CH2] to do a luminance or a linear key with a dedicated key channel. Select the channel (...CH1 or ...CH2) that has an external key signal or video input that will be used as a key source, and fill with video from the other channel.

For this lesson, select luminance key as the key type by selecting [SELF KEY] and leaving [LINEAR KEY] off.



9. The CLIP and GAIN controls are used to adjust both luminance and linear keys and work the same way for both.

   The CLIP and GAIN knobs are automatically delegated to the correct mode whenever you select a luminance or a linear key.
   a. Turn the CLIP knob to determine how much of the source video is used to make the key, based on luminance levels. Full counter clockwise clips the highest luminance levels while full clockwise uses the entire video signal to make the key.
   b. Turn the GAIN knob to adjust the opacity of the key over the background, or the softness of the key edges. Full clockwise is maximum gain for highest opacity and edge sharpness.

NOTE: *To set the linear keyer to unity (gain = 1), hold down the* [LINEAR KEY] *pushbutton for two-thirds of a second. At unity gain, a linear key's edge will have exactly the same shape and softness as the key source input.*

Inverting a Key

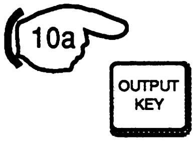
You can invert a key—that is, key from a black-on-white source instead of a white-on-black source—by selecting [KEY INVERT]. When this pushbutton is selected, the luminance level of the key source signal is inverted; the key will be inserted into the background video wherever the luminance level is *lower* than the CLIP level.

Placing Keyed Video on the PROGRAM Output

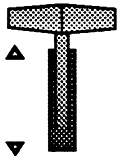
The keys produced by the KEYER are available as a key signal at the KEY OUTPUT signal, as shaped or unshaped video at the CLEAN FEED OUTPUT, and as keyed video at the PROGRAM OUTPUT.

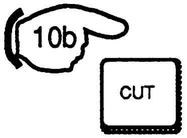
NOTE: *You can use output key parameters as part of a key frame effect by saving them as part of a key frame. You cannot save output key cuts, auto transitions, or lever transitions. Instead, you must set the duration of the key frame to determine the time it takes for the output key parameters function to be performed.*

Placing a key on the PROGRAM output, or taking it off if it is already on, is called a key transition.

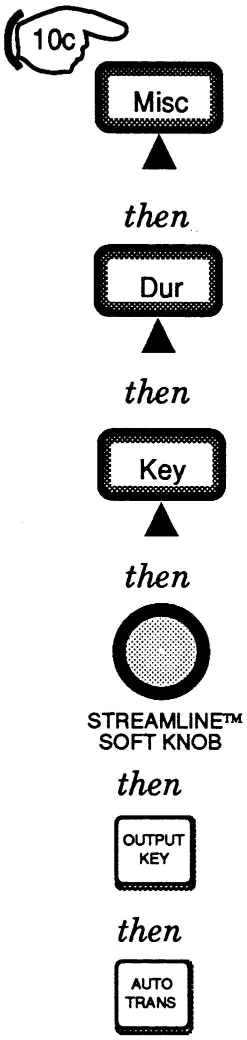


then



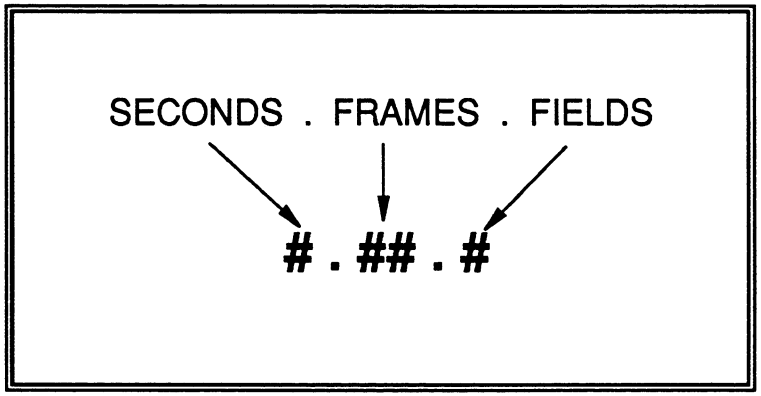


10. There are three ways to perform a key transition: a manual lever transition, an instantaneous cut, or an automatic transition.
    a. Lever Transition: Press [OUTPUT KEY] in the TRANSITION section. This delegates the lever to the keyer so that you can perform a key transition manually. Using the lever allows you to vary the transition by changing speed or even direction. Moving the lever from one limit to the other will perform one complete key transition.
    b. Cut: Press [OUTPUT KEY] in the TRANSITION section. This delegates the [CUT] pushbutton in the TRANSITION section to the keyer. Press [CUT]; a key transition will take place instantly.


10c
Misc
then
Dur
then
Key
then
STREAMLINE™
SOFT KNOB
then
OUTPUT
KEY
then
AUTO
TRANS

c. Automatic Transition: Select {Misc} from the STREAMLINE™ Home Menu, then select {Dur}. Press {Key}; this delegates the soft knob to adjust the duration of an automatic key transition. Turn the knob to enter a transition rate; the numbers in the DIRECT ENTRY display will represent the number of seconds, additional frames, and additional fields, separated by decimals, as shown below (default is 1 sec).

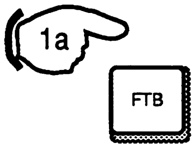
Press [OUTPUT KEY] in the TRANSITION section. This delegates the [AUTO TRANS] pushbutton in the TRANSITION section to the keyer. Press [AUTO TRANS] and a key transition will take place automatically at the programmed key transition rate.


SECONDS . FRAMES . FIELDS
# . ## . #

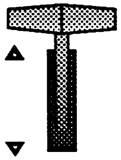
***NOTE:** Although the key is combined from two channels, each channel is independently controlled. You can delegate to Channel 1, transition the key off. Also you can delegate to Channel 1 and Channel 2, and do a cross fade bringing Channel 1 up and Channel 2 down at the same time.*

LESSON 2-25:
FADE TO BLACK TRANSITIONS

The Fade to Black function gives you a simple way to take the DPM-700 PROGRAM output to black at any time. You can also program fade to black transitions into key frame effects.



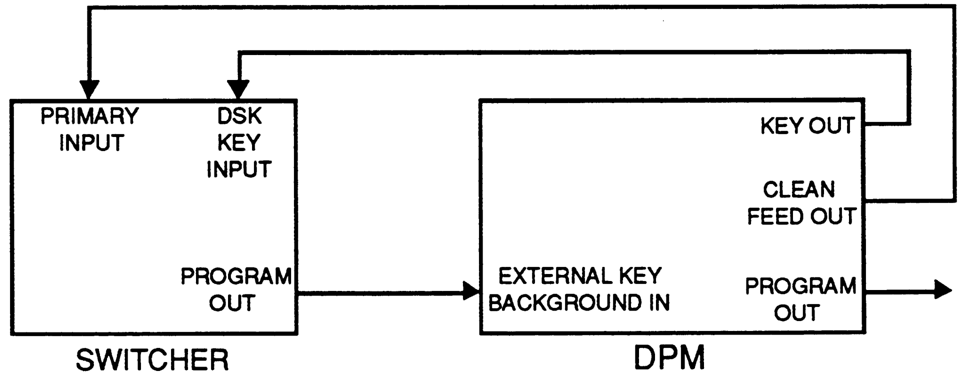
then

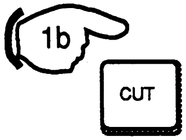


1. There are three ways to perform a live fade to black transition: a manual lever transition, an instantaneous cut, or an automatic transition.

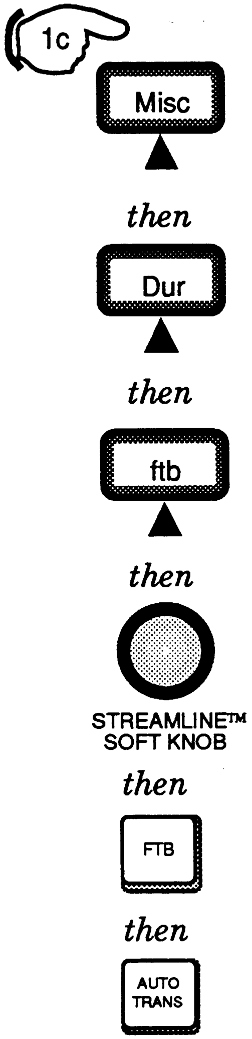
   a. Lever Transition: Press [FTB] in the TRANSITION section. This delegates the lever to the fade to black function for manual fade-to-black transitions. Using the lever allows you to vary the transition by changing speed or direction. Moving the lever from one limit to the other performs a complete fade to black transition. Move it back to fade up from black.

The DPM's fade to black function affects only the PROGRAM output and not the KEY or CLEAN FEED. If the DPM is connected downstream from a switcher, it can be used to fade the switcher 's PROGRAM OUT to black via the EXTERNAL KEY BACKGROUND path.


PRIMARY INPUT
DSK KEY INPUT
PROGRAM OUT
SWITCHER
KEY OUT
CLEAN FEED OUT
EXTERNAL KEY BACKGROUND IN
PROGRAM OUT
DPM



b. Cut: Press [FTB] in the TRANSITION section. This delegates the [CUT] pushbutton in the TRANSITION section to the fade to black function. Press [CUT]; a fade to black transition will take place instantly.



c. Automatic Transition: Select {Misc} from the STREAMLINE™ Home Menu, then select {Dur}. Press {ftb}; this delegates the soft knob to adjust the duration of an automatic fade to black transition. Turn the knob to enter a transition rate; the number in the DIRECT ENTRY display will represent the number of seconds, followed by a decimal and the number of additional frames (default is 1 sec).

Press [FTB] in the TRANSITION section. This delegates the [AUTO TRANS] pushbutton in the TRANSITION section to the fade to black function. Press [AUTO TRANS] and a fade to black transition will take place automatically at the programmed fade to black transition rate. Press [AUTO TRANS] again to fade up from black.

NOTE: *When* [FTB] *is selected in the TRANSITION section, the CUT pushbutton will light as a status indicator whenever the Program output is in black.*

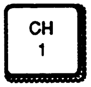
Using Fade To Black In Key Frame Effects

NOTE: *You can use fade to black as part of a key frame effect by saving a fade to black state as part of a key frame. You can save only the fade to black state. For example, you can save the state where the picture is 50% faded to black or where the picture is entirely in black (100%). You cannot save fade to black cuts, auto transitions, and lever transitions. Instead, you must set the duration of the key frame to determine the time it takes for the fade to black function to be performed.*

2

DELEGATION

Hold down

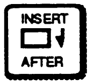


then press

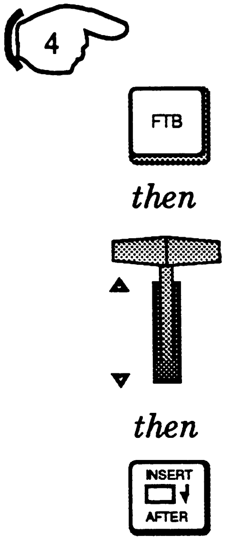
2. Fade to black is a function of the global channel, so you must have the panel delegated to [GLOBAL] in order to save a fade to black state. Hold down [CH 1] in the DELEGATION section and press [GLOBAL]. This selects Channel 1 as the active channel and Global Control as a modify channel.

3

Set up a key frame.

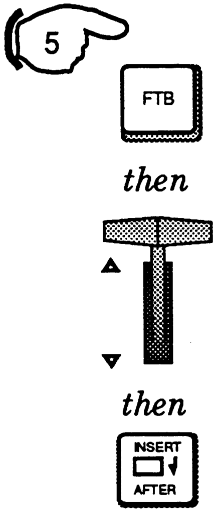


3. Set up a key frame without using fade to black. Insert this key frame into your effect.



4. For this lesson, select [FTB] in the TRANSITION section and use the lever to fade the picture about halfway to black. Press [INSERT AFTER] to insert this new key frame into your effect.

   Since only the fade to black state is saved in a key frame, it doesn't matter which control you use to get to that state. That is, you can use [CUT], [AUTO TRANS], or the lever; the result will be the same. However, it is easiest to use the lever to get to an intermediate fade to black state.



5. Move the lever in the reverse direction from Step 4 to bring the picture up out of black. Press [INSERT AFTER] to insert this key frame into your effect.

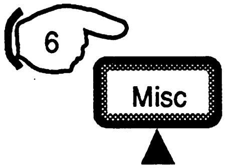
   When you run this part of your key frame effect, you will see the picture fade halfway to black; the duration of this fade will be one second, the default key frame duration. The picture will then fade up out of black; the effect will take two seconds. Remember that key frame duration and not fade to black duration determines how long a fade to black takes when it is stored in a key frame.

To change the fade-to-black transition time in a key frame effect, change the duration of the key frame(s) in the effect that perform the fade. Remember that a key frames's duration is the time between it and the next key frame.

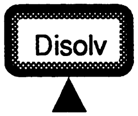
Further Modifications—Effect Dissolve

When you run an effect, it normally starts to run instantly, beginning with the first key frame. The Effect Dissolve function lets you delay the start so that you can change gradually to that key frame over a period of time instead of snapping to it abruptly. That is, instead of going immediately to the first key frame of the effect, the DPM-700 will "dissolve" or change gradually from its existing state to the key frame state at whatever rate is set for the Effect Dissolve function. This rate can be from 0 seconds (a cut) to 999,999 seconds.

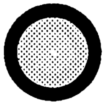
NOTE: *If you want to store an effect dissolve time into an E-MEM®, you must use [LEARN GLOBAL] even if you have no Global key frames.*



then

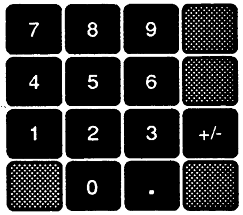


then



STREAMLINE™
SOFT KNOB

or

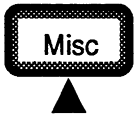


then

6. Before beginning this operation, make sure you have an effect in the current effect space. To set the Effect Dissolve rate for the effect, select {Misc} from the STREAMLINE™ Home Menu. Select {Disolv} and use the soft knob to enter the rate in seconds, frames, and fields. (If you want to learn the effect into a register, select [LEARN CH 1] and [LEARN GLOBAL], then enter the desired bank/register number.)

   To see the effect dissolve, press [REWIND], set up a key frame which is visibly different from the first key frame in the effect, then press [RUN].

Looping and Linking



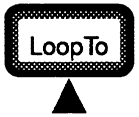
then

Looping is a function which allows you to run any designated region of an effect over and over again.

1. First, build a three key frame effect. Then press [MISC], [LOOP], [LOOP FROM]. Type in 2.0 and press [ENTER]. Press [LOOP TO], 0 then [ENTER]. Select [LOOP], press [RUN]. The effect runs over and over again. To stop the effect, press the RUN button again, or run any other E–MEM® register.

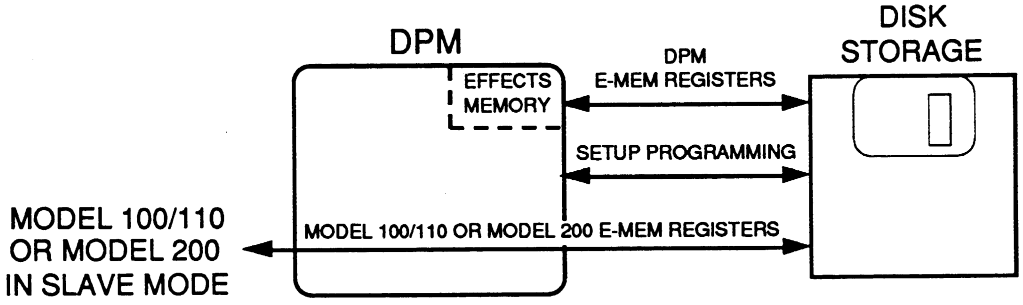
The values entered for {LoopTo} and {LoopFm} are times on the effect's time line. You can use the elapsed duration value in the top line of the STREAMLINE™ display to determine the value to enter for any location in the effect.

NOTE: *To make a smooth, continuous loop you can make the "to" and "from" key frames identical in appearance and location.*



LESSON 2-26:
DISK STORAGE OF E-MEM® REGISTERS AND SETUP DATA

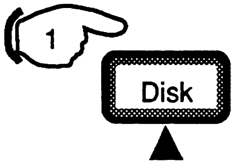
Your DPM-700 includes an internal disk drive so that you can save E-MEM® Effect Memory registers and/or Setup data off-line. You can also save Model 100/110 and Model 200 switcher E-MEM® registers.


DPM
EFFECTS MEMORY
DPM E-MEM REGISTERS
DISK STORAGE
SETUP PROGRAMMING
MODEL 100/110 OR MODEL 200 IN SLAVE MODE
MODEL 100/110 OR MODEL 200 E-MEM REGISTERS

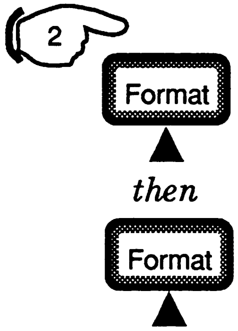
Disk Storage: *You can save DPM-700 E-MEM® Effects Memory registers onto 3 1/2" floppy disks for later recall. You can store an individual register, a bank of ten registers, or all 99 registers together. You can also store DPM-700 Setup programming and Model 100, 110, or 200 switcher E-MEM® registers onto the same disks..*

How to Format a Disk

Before you can use a disk for storage, you must format it.



1. Select {Disk} from the STREAMLINE™ Home Menu. If the disk has never been formatted for the DPM-700, the word "Unformatted" will appear in the upper lefthand corner of the display. If the disk has been formatted, its name will appear there. Formatting a disk which has been previously formatted will erase all data stored on it.

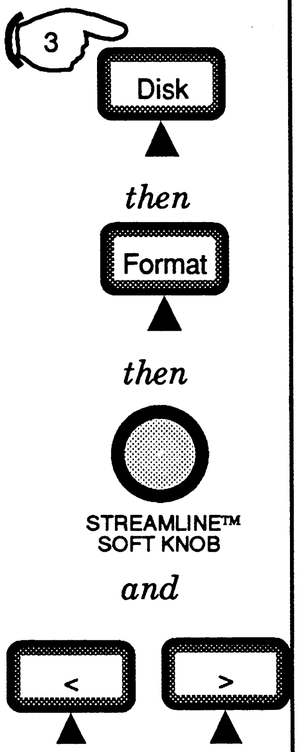


2. Select {Format} from the Disk Menu; a new menu will appear. (To name a new disk, or to rename an old one, see "Labeling a Disk" on the next page.) Press {Format} in this new menu to format the disk. The process will take about one minute. The message "Formatting Disk" will appear in the display and will disappear when formatting is complete.

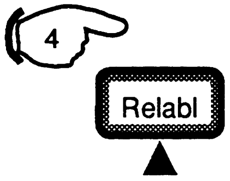
***NOTE:** A newly formatted disk's name will appear in the display only after you remove and reinsert the disk.*

Labeling (Naming) a Disk

When you insert a disk, its name appears in the upper lefthand corner of the display. The name can be up to eight characters long and can include letters (A-Z), numbers (0-9), and/or lines (_).



3. Select {Disk} from the STREAMLINE™ Home Menu, then select {Format}. The disk's current name will appear in the upper lefthand corner of the display. A blinking cursor will appear over one of the name's characters.
   - Turn the soft knob to change the character.
   - Press the pushbuttons under {<} and {>} to move the cursor to another character.



4. Press {Relabl} to change the disk's name to the new name you entered.

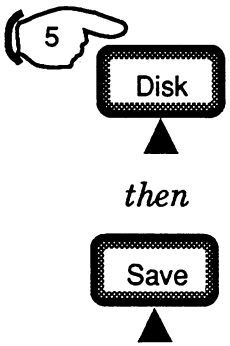
***NOTE:** You can enter a blank space instead of a letter or number for any remaining characters if the name is shorter than eight characters. To do so, place the cursor on the last character and turn the knob until a blank space appears (between Z, _, and 0).*

Saving To a Disk

Once you have created a key frame effect, you can save it into an E-MEM® Effects Memory register. You can then store your E-MEM® registers off-line onto 3 1/2" floppy disks. Disk storage provides security against accidental erasures and expands available memory. It also allows you to move effects to a different DPM-700.

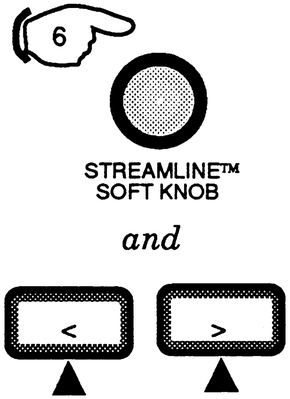
In addition, the DPM-700 lets you store Setup data, a software function which allows you to adjust the timing and phase of your DPM-700 and to select personality setups such as cropping. This is useful if you plan to use several different setup configurations, since it allows you to save and recall as many as you need. You can also use your DPM-700 to save Model 100/110 and Model 200 switcher E-MEM® registers.

In summary, you can save and recall:
- all 99 DPM-700 E-MEM® registers
- a bank of ten DPM-700 E-MEM® registers
- a single DPM-700 E-MEM® register
- the current Setup data
- a single Model 100/110 E-MEM® register
- all 16 Model 100/110 E-MEM® registers
- a single Model 200 E-MEM® register
- a bank of Model 200 E-MEM® registers

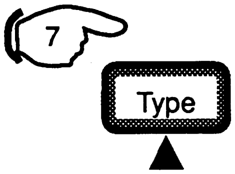


5. Select {Disk} from the STREAMLINE™ Home Menu, then select {Save}. A new menu will appear. The name of the currently selected disk file will appear in the upper lefthand corner of the display as a base name, followed by a period (.) and then three letters which identify the file type as follows:

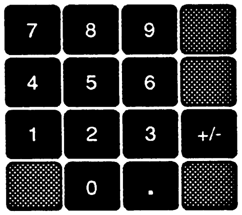
BASE_NAME.TYPE



6. A blinking cursor will appear over one of the base name's characters.
   - Turn the soft knob to change the character.
   - Press the pushbuttons under {<} and {>} to move the cursor to another character.

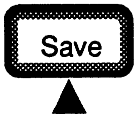


then



then

then



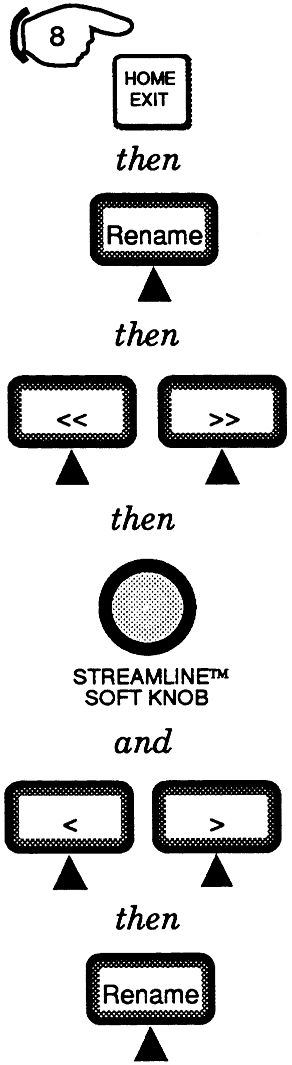
7. To change the file type, press type until the type you want is selected; the base name will not change.
   - .EMM = All E-MEMs
   - .BNK = E-MEM Bank: # (the top line of the display shows which bank from 0-9)
   - .REG = E-MEM Reg: # (the top line of the display shows which register from 00-99)
   - .SUP = Setup
   - .100 = All M100 E-MEMs
   - .101 = M100 E-MEM Reg: # (the top line of the display shows which register from 0-15)
   - .200 = M200 E-MEM Bank: # (the top line of the display shows which bank from 0-2)
   - .201 = M200 E-MEM Reg: # (the top line of the display shows which register from 0-29)

***NOTE:** The Model 100 or the Model 200 selections will appear in the display, depending on which is selected in the slave port assignments.*

If you are saving individual registers or a single bank of registers, use the keypad to select the desired register/bank number. The top line of the display will show your selection.

Press {Save} to save the file to disk.

The File Rename Menu



8. To get out of the {Save} menu, press [HOME/EXIT]. Select {Rename} from the Disk Menu; a new menu will appear. The name of the currently selected file will appear in the upper left-hand corner of the display as follows:

   BASE_NAME.TYPE

   Press the {<<} and {>>} pushbuttons to cycle through the names of all the files on the disk until you reach the one you want to change.

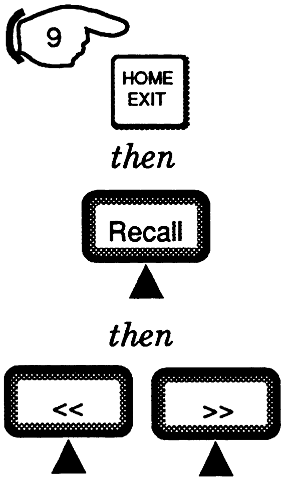
   A blinking cursor will appear over one of the name's characters. To change the base name:
   - Turn the soft knob to change the character.
   - Press the pushbuttons under {<} and {>} to move the cursor to another character.

   Press {Rename} to confirm the new file name.

Recalling an E-MEM® Register From a Disk

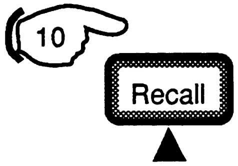
Once you have saved a file on disk, you can recall it at any time. As with saves, you can recall:

- all 99 DPM-700 E-MEM® registers
- a bank of ten DPM-700 E-MEM® registers
- a single DPM-700 E-MEM® register
- the current Setup data
- a single Model 100/110 E-MEM® register
- all 16 Model 100/110 E-MEM® registers
- a single Model 200 E-MEM® register
- a bank of Model 200 E-MEM® registers



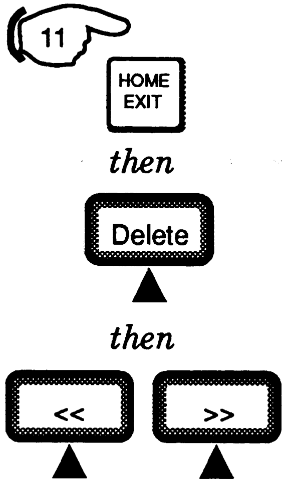
9. To get out of the {Rename} menu, press [HOME/EXIT]. Select {Recall} from the Disk Menu; a new menu will appear. The name of the currently selected file will appear in the upper left-hand corner of the display. Press {<<} and {>>} to cycle through the names of all the files on the disk.

***NOTE:** You can also select a file by using the {<} and {>} pushbuttons and soft knob to enter the name directly. Once you have the base name you want, press {Type} to select the file type. Use the keypad to select a register / bank number, if applicable.*

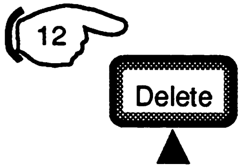


10. Press {Recall} to recall the file from disk.

Deleting a File From a Disk



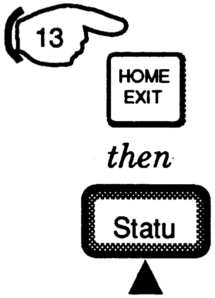
11. To get out of the {Recall} menu, press [HOME/EXIT]. Select {Delete} from the Disk Menu; a new menu will appear. The name of the currently selected file will appear in the upper lefthand corner of the display. Press {<<} and {>>} to cycle through the names of all the files on the disk.



12. Press {Delete} to delete the selected file from the disk.

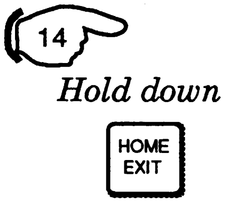
NOTE: *There is no way to undo a delete file operation using the DPM-700. you may be able to recover deleted files with file-recovery software on an IBM compatible personal computer.*

Disk Status: Checking Disk Space Used



13. To get out of the {Delete} menu, press [HOME/EXIT]. Select {Statu} from the Disk Menu; a new menu will appear. The name of the disk will appear in the upper lefthand corner of the display. The amount of space used and free (available) will be shown as follows:

    # Bytes Used   # Bytes Free



14. Hold down [HOME/EXIT] for 1/2 second to get out of the {Status} menu and return to the STREAMLINE™ Home Menu.

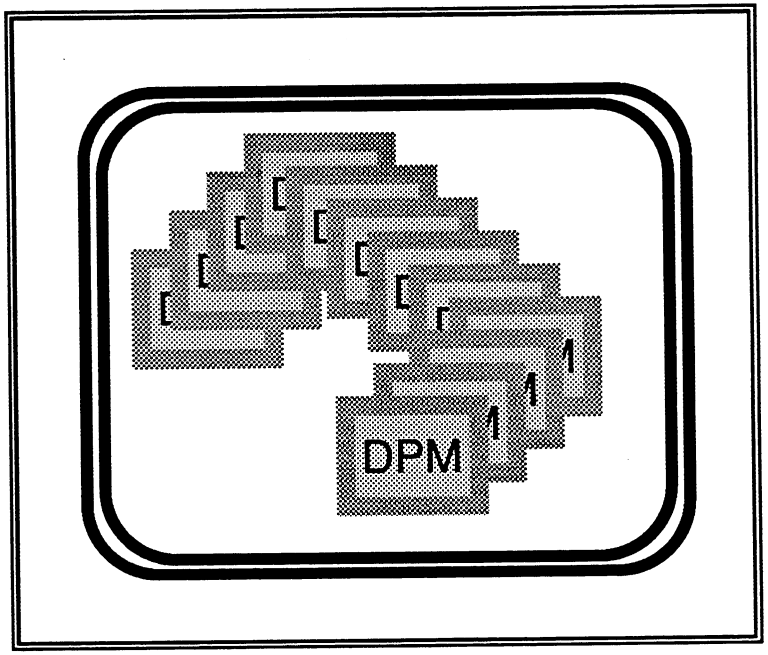
Section 3
Tutorial—Advanced Effects

INTRODUCTION

This section of the manual tells you how to operate the system options: Recursive Memory, Second Channel, and 10 x 1 Input Selector. The section also tells you how to use the DPM-100 in special modes of operation, such as upstream-downstream.

LESSON 3-1:
USING THE RECURSIVE MEMORY OPTION

Recursive refers to an effect in which a picture is stored so that its image can be retained on-screen as new pictures are added. Over time, this produces a multiple-image effect, as shown below.



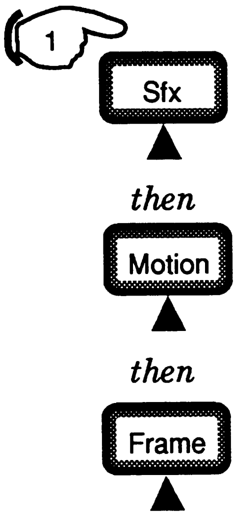
***NOTE:** You can perform Recursive Memory operations even if your DPM-700 does not have the Recursive Memory option installed. Without the option you will not see any Recursive effects on the output of your DPM-700, but you can still program and/or modify effects, store them on a disk, and transfer them to another DPM-700 which does have a Recursive Memory option.*

The DPM-700 provides you with three different recursive effects, each of which can be combined with other manipulations to produce an almost infinite variety of images:

- Trails is an effect in which a recursive picture is dropped (left on screen) at each strobe point, creating a trail effect as the input picture moves on the screen.
- Subtraction is a recursive effect in which existing pictures are subtracted or erased from the screen at each strobe point, allowing the background to show through. That is, the newest recursive effects erase the older ones.
- Montage is an effect in which a recursive picture is dropped at each global key frame instead of at each strobe point.

Recursive effects are part of the Global Control channel. In order to set up and enter a recursive effect key frame into your current effect, you must select [GLOBAL] in the DELEGATION section of the panel. However, you can make adjustments to recursive effect values without the panel being delegated to [GLOBAL].

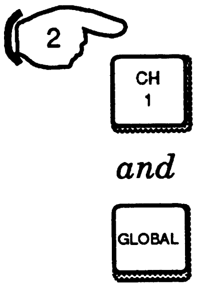
NOTE: *Before beginning this lesson, set the system to its default state by deleting the current effect and clearing the working key frames.*



Field Storage and Frame Storage

Before creating your trails effect, you should select either field storage or frame storage for the recursive pictures.

- Field storage stores a single field and displays it twice to create a frame. Because the same field is displayed twice instead of two different fields, the effect will be more stable than frame storage, but it may be slightly less sharp.
- Frame storage stores both fields of a frame. Because the two different fields are displayed at the same time, the effect will be sharper and more detailed than field storage, but it may be slightly less stable if there is motion in the video image.



1. Select {Sfx} from the STREAMLINE™ Home Menu and then press {Motion}. For this lesson, select frame storage by pressing {Frame} under the "Store" heading in the display.
2. Select both [CH 1] and [GLOBAL] in the DELEGATION section of the panel. This selects the Channel 1 input for manipulation and selects global control so that you can store recursive states in key frames.

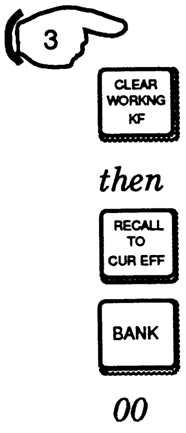
Field/Frame Transition

The channels of the DPM-700 manipulate their images on a field-by-field basis. This can cause problems in recursive memory because of the one-frame-long recursive strobe. The location of the picture changes during the strobe producing a jittering picture in the recursed image. Switching the channel to {Frame} transition corrects this problem by forcing the channel to pause for one full frame while the image is strobed into the recursive memory system.

NOTE: The transition mode is NOT adjustable in the Global channel.

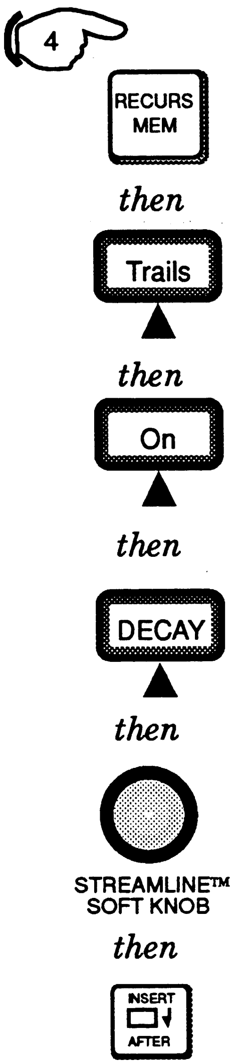
NOTE: If you want to perform Channel 1 transforms only, turn off {XFMGBL} under {Modes} in the {Person} menu (all caps indicates ON); this disables Global transforms, but allows you to store Global key frames.

Trails



3. To begin your effect, hold down [CLEAR WORKING KF] 1/2 second to set the Channel 1 and Global parameters to the defaults.
   Recall E-MEM® register 00 to the current effect space to clear it.

NOTE: You should select your background, whether in {MATTE} or {EXT}, so that there is enough contrast between the picture edges and the background to make the recursive effects visible.



4. Select [Recurs Mem] from the STREAMLINE™ DIRECT section of the control panel.

   Select {Trails}. This brings up a new menu which lets you set up your trails effect. Select {on} and {Decay} and use the soft knob or keypad to set 0% decay. Press [INSERT AFTER].

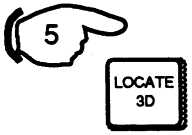
   - You can select decay (0 to 100%) so that the recursive pictures progressively fade away into the background over time. The percentage numbers indicate the amount of decay per frame.

   - You can select whether the new recursive pictures appear in front of (over) or behind (under) the older pictures.

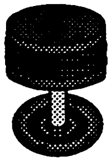
   - You can use the Strobe-Title function to produce an interrupted rather than a smooth recursive effect. In Strobe-Title mode, recursive pictures are still dropped on-screen when a strobe occurs, but the new video will not appear between strobe points.

   - You can select star trails, an effect in which random pixels in the recursive pictures are removed and replaced by the background over time. As the pixels "blink out," they produce a sparkling effect.

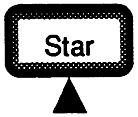
   - You can adjust the time lapse between recursive pictures by changing the strobe time.



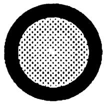
then



then



then



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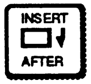
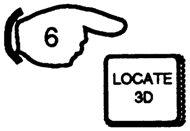
SOFT KNOB

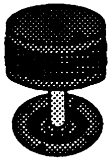
then



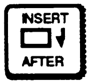
5. For this lesson, move the picture away from you and to a different location; the trails effect is most visible as a picture moves. Press {Star} and use the keypad or the soft knob to enter a star value of 30.00 (the possible range is from 0-100%). Insert this working key frame into your current effect as key frame #2.



then



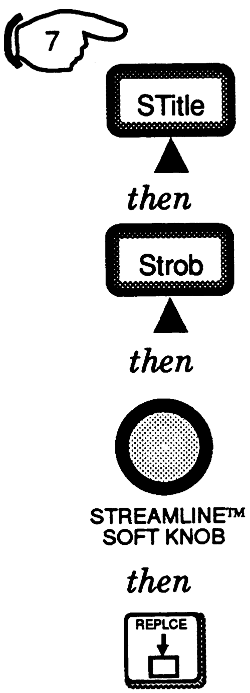
then



6. Move the picture to a different location. Insert this as key frame #3. Except for location, key frame #3 is identical to key frame #2.

   Run the effect and you will see the picture leave a sparkling star trail as it moves.

   Instead of leaving a solid trail between key frame #1 and key frame #2, star trails are left during the entire effect. This is because the default path characteristic is {Smooth}, which creates a gradual change from 0% stars at key frame #1 to 30% stars at key frame #2. To delay stars completely until key frame #2, select {Holds} in the {Path} menu and enable the {Hold} function for "Trail Star Decay" at key frame #1. Remember to [REPLCE].



7. In a recursive effect, normally you can see the picture as it moves between the strobe points; this was the mode used for the trails effect you set up in Steps 5 and 6. There is also a special Strobe-Title mode which stops the picture from appearing between strobe points. That is, it will only be visible when it is dropped at each strobe point.

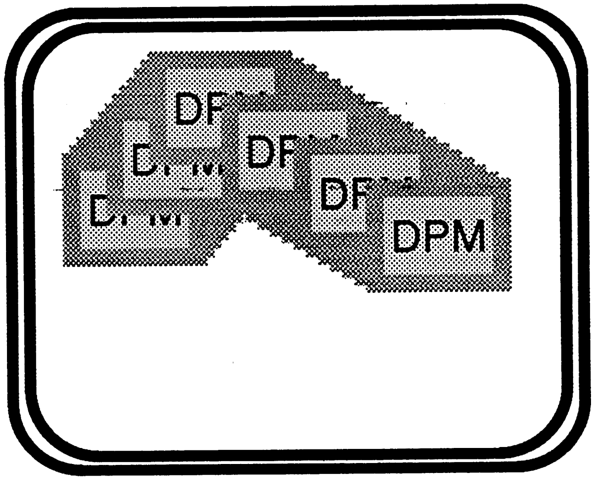
   Go to key frame 2 and in the {Trails} menu press {STitle} to turn on the Strobe-Title effect. A strobe rate slower than the default of every frame (0.01.0) must be used to see a difference. Select {Strob} and set the rate to every 5 frames (0.05.0) with the soft knob or keypad. Press [REPLCE] to replace key frame #2 with the new keyframe.

   Run the effect again and notice the difference in appearance between the trails effect from key frame #1 to #2, and the similar effect from key frame #2 to #3. For the path between key frames #2 and #3, a trail of recursive pictures will appear only at each strobe point; the picture will not be visible between strobe points.

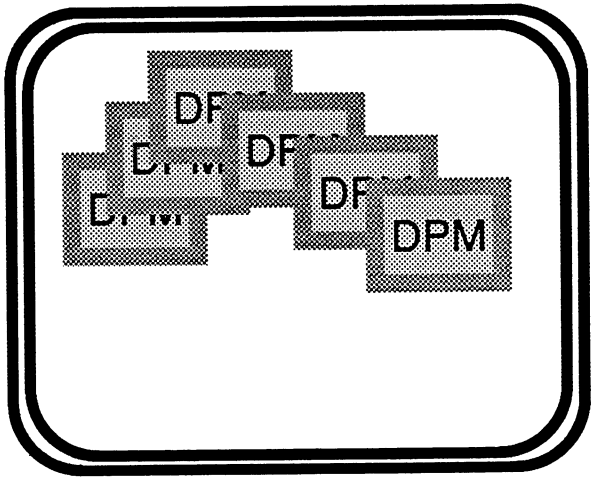
   To prepare for the next step, go to key frame 3. Making the same entries as shown above, enable {STitle}, set {Strob} to 0.05.0, and press [REPLCE].

Recursive pictures are dropped (left on screen) at each strobe point.

With Strobe-Title off, you can see the picture as it moves between these points.



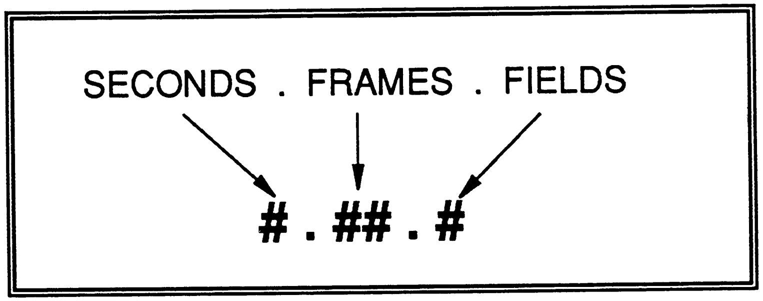
With Strobe-Title on, you see the picture only at the strobe points.

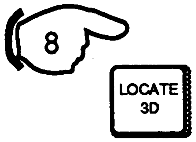


Strobe-Title Mode: *The picture will only be visible when it is dropped at each strobe point.*

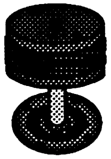
You can adjust the time lapse between recursive pictures by changing the strobe speed. Time is measured in seconds, frames, and fields as shown in the picture below.

- The minimum strobe time is 0.01.0 (one frame) between strobes; this is the default value.
- The maximum usable strobe time is determined by the length of the key frame. Strobe timing is restarted with each new global key frame. If the strobe time is longer than the key frame duration, a strobe will never occur.

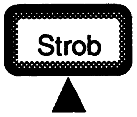




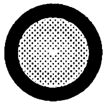
then



then

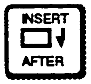


then



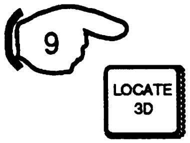
STREAMLINE™
SOFT KNOB

then

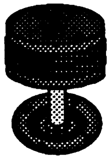


8. Select [LOCATE 3D] and move the picture to another location. Select {Strob} and use the soft knob or keypad to enter a new strobe time of 0.15.0. Press [INSERT AFTER] to insert this key frame into your current effect as Key Frame #4.

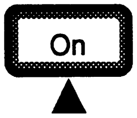
   Run the effect and notice the difference in the Strobe-Title effect between Key Frames #2 and #3, and the effect between Key Frames #3 and #4. Between Key Frames #2 and #3, the strobe occurs every five frames (0.05.0); between Key Frames #3 and #4, it will gradually slow down to every fifteen frames.



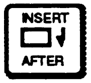
then



then



then



9. Move the picture to a different location. Press {ON} again to turn off the trails effects; the word "ON" will go to lower case to indicate that the function is now off. Press [INSERT AFTER] to enter this effect as key frame #5.

***NOTE:** The strobe value is used for subtraction and montage effects as well as for trails. It will remain the same until you change it again; it does not revert to default when you turn the trails function off.*

To pepare for the next step, select [MODIFY], {ModAll}, and set the {Star} value to 1.00 (The [RECURS MEM] pushbutton will take you back to the Trails menus). Press [REPLCE] to make the change in all key frames in the effect.

Subtraction Effect

10. Select [LOCATE 3D] and move the picture to a location about halfway between key frame #5 and key frame #4. Press [HOME/EXIT] to return to the top-level Recursive Menu, then select {Subtrc}. This brings up a new menu which lets you set up your subtraction effect. Press {on} to turn on the subtraction mode.
    - You can use the Strobe-Title function to produce an interrupted rather than a smooth recursive subtraction effect. In Strobe-Title mode, recursive pictures are still subtracted when a strobe occurs, but no subtraction will occur between strobe points.
    - You can adjust the time lapse between recursive subtraction effects by changing the strobe speed.

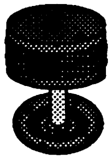
    Press [INSERT AFTER] to insert key frame #6.

    Run the effect and you will see the recursive subtraction effect between key frame #4 and key frame #5 as the effect reaches key frame #6.

10

LOCATE 3D

then



then

HOME EXIT

then

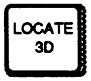
Subtrc ▲

then

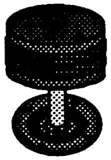
On ▲

then

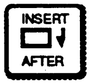
INSERT AFTER



then



then



11. Select [LOCATE 3D] and move the picture to a different location and insert key frame #7.

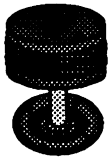
    Run the effect and you will see a recursive subtraction effect at each strobe point between key frames #6 and #7; the subtraction will not occur between strobe points.

    Note that the Subtract effect has its own strobe setting with a {Strob} selection in the Subtract menu.

12

LOCATE 3D

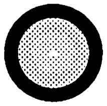
then



then

Strob ▲

then



STREAMLINE™ SOFT KNOB

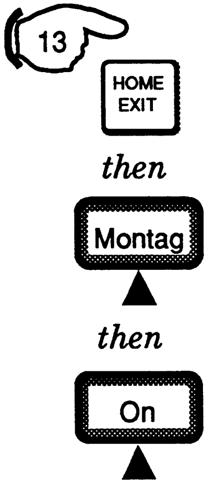
then

INSERT AFTER

12. Move the picture to a different location. Select {Strob} and use the soft knob or keypad to enter a strobe value of 0.20.0. Press [INSERT AFTER] to insert this key frame into your current effect as Key Frame #8.

    Run the effect and notice the difference in the strobing effect between key frames #6 and #7, where the strobe occurs every frame, and between key frames #7 and #8, where the strobe occurs every twenty frames.

Montage



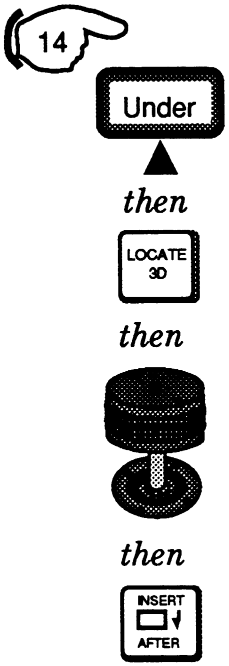
13. Press [HOME/EXIT] to return to the top-level {Recurs} Menu, then select {Montag} and {On}. This turns montage mode on and brings up a new menu which lets you set up a montage effect.

    - You can select whether the new recursive pictures appear in front of (over) the older pictures, behind (under) the older pictures, or whether they erase the older pictures and let the background show through. {OVER} is the default.

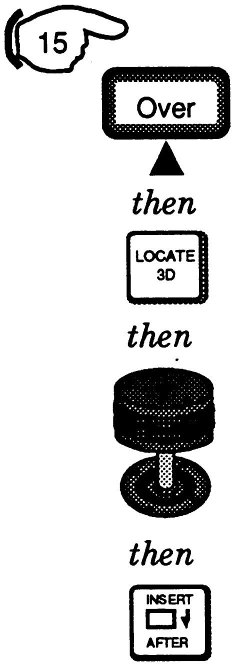
    - You can use the Strobe-Title function to produce an interrupted rather than a smooth recursive effect. In Strobe-Title mode, recursive pictures are still dropped on-screen when a strobe occurs, but the picture will not appear between strobe points.

    - You can select decay so that the recursive pictures progressively fade away into the background over time.

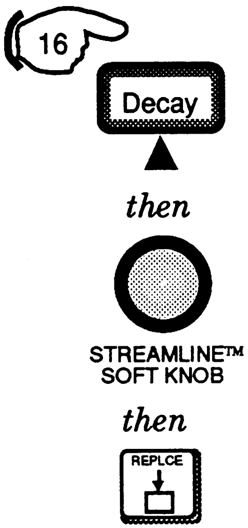
    - You can select star, an effect in which random pixels in the recursive pictures are removed and replaced by the background over time. As the pixels "blink out," they produce a sparkling effect.



14. Select {Under}. Move the picture to four different locations in turn; insert each new position as a global key frame (Key Frames #9, #10, #11, and #12). Run the effect and you will see a recursive montage picture dropped at each key frame. New pictures will appear under (behind) the older pictures.


15
Over
then
LOCATE 3D
then
then
INSERT
AFTER

15. Select {Over}. Move the picture to four different locations in turn; insert each new position as a global key frame (Key Frames #13, #14, #15, and #16). Run the effect and you will see a recursive montage picture dropped at each key frame. New pictures will appear over (in front of) the older pictures.


16
Decay
then
STREAMLINE™
SOFT KNOB
then
REPLCE

16. To change the montage decay value for all key frames in the effect, begin by selecting [MODIFY] and {ModAll}. [RECURS MEM] will return you to the Montage menu.

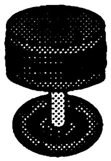
    Press {Decay} and use the soft knob or key pad to enter a decay value of 10.00 (the possible range is from 0-100%). Press [REPLCE] to replace all key frames' decay values with this new value.

    Run the effect and you will see a recursive montage picture dropped at each key frame, with the older recursive pictures fading away over time.

17

LOCATE 3D

then



then

STitle ▲

then

INSERT AFTER

then

STitle ▲

17. In a recursive montage effect, normally you can see the picture as it moves between key frames. Strobe-Title mode stops the picture from appearing between key frames. That is, it will only be visible when it is dropped at each global key frame.

{STitle} is used to turn on the Strobe-Title effect. Move the picture to four different locations in turn, enabling {STitle}, and insert each position as a global key frame (Key Frames #17, #18, #19, and #20). Disable {STitle} after each insertion so the picture will be visible while you move it to another location. Run the effect and you will see a recursive montage picture dropped at each key frame; the picture will not be visible between key frames.

NOTE: *When you have finished setting up your recursive effects, be sure to go to the top level {Recurs} menu and press {Off} to turn off all recursive effects.*

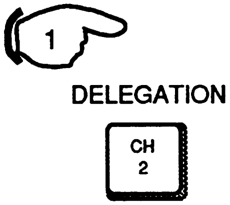
LESSON 3-2:
USING THE OPTIONAL SECOND CHANNEL

Each DPM-700 comes with one standard channel of video. You can add an optional Second Channel that is identical to the first in function and operation, but more than doubles the power of your system.

When you use it as a single channel, Channel 2 operates exactly the same as Channel 1. However, you can also use the two channels in combination to create effects which would be impossible with one channel alone.

One of the most useful modes of two-channel operation is to use one channel for video and the other as a dedicated key channel. This allows you to perform a split key, using one channel's signal to "cut" the hole and the other to fill it. For example, you could select the picture of a flag on Channel 1 as the video fill and a rocket ship on Channel 2 as the key. By having Channel 2 key Channel 1, you would end up with a rocket-ship shape filled with the flag pattern.

One-Channel Operations

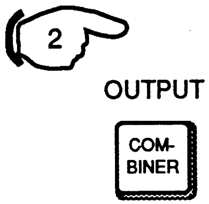


1. To perform operations using Channel 2 alone, select [CH 2] in the DELEGATION section of the control panel. This will delegate the DPM-700 control panel to Channel 2 only.

   The INPUT, TRANSFORM, DIRECT ENTRY, TRANSITION, and KEYER sections of the panel operate the same for Channel 2 as they do for Channel 1. The only difference is that they act on different inputs and parameters:
   - The inputs for Channel 2 are separate from the inputs for Channel 1.
   - Each channel has its own set of transform parameters. The Channel 2 center-of-orbit cursor is an "x;" (Channel 1's is a "+.")
   - Channel 2 has its own, separate luminance/linear keyer, though it uses the same control panel as the Channel 1 keyer.

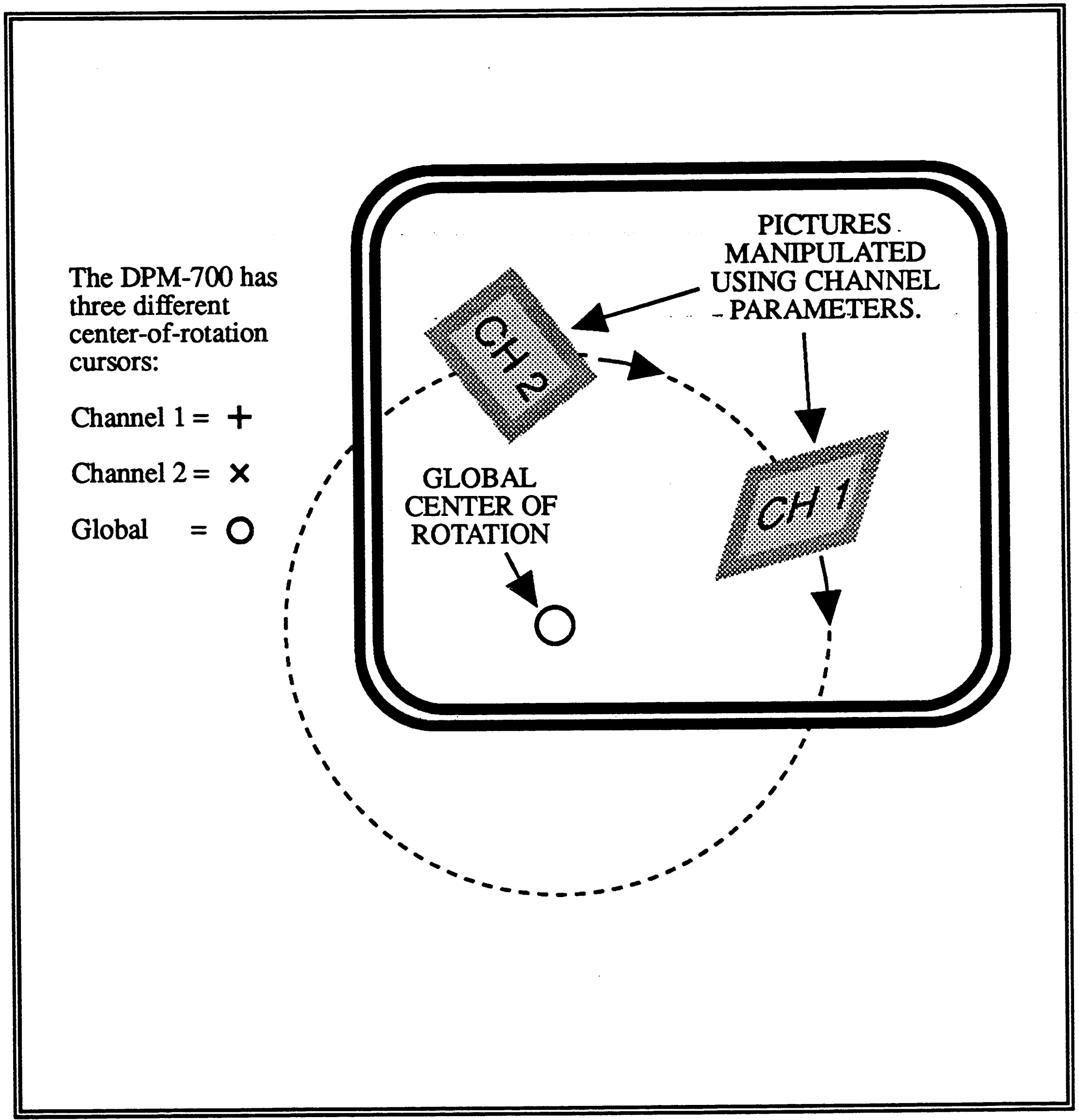
Combined-Channel Operations

Other sections of the control panel can also be delegated to Channel 2, but these sections operate in combination with Channel 1 and Global control as follows:



2. **System Outputs.** In the OUTPUT section, select [COMBINER]. This allows you to see the combined Channel 1 and Channel 2 video paths on the CLEAN FEED, PROGRAM, and KEY outputs.

NOTE: *If you want to see only Channel 2 on the output, select* [CH 2] *in the* OUTPUT *section.*



The DPM-700 has three different center-of-rotation cursors:

Channel 1 = +

Channel 2 = ×

Global = ○

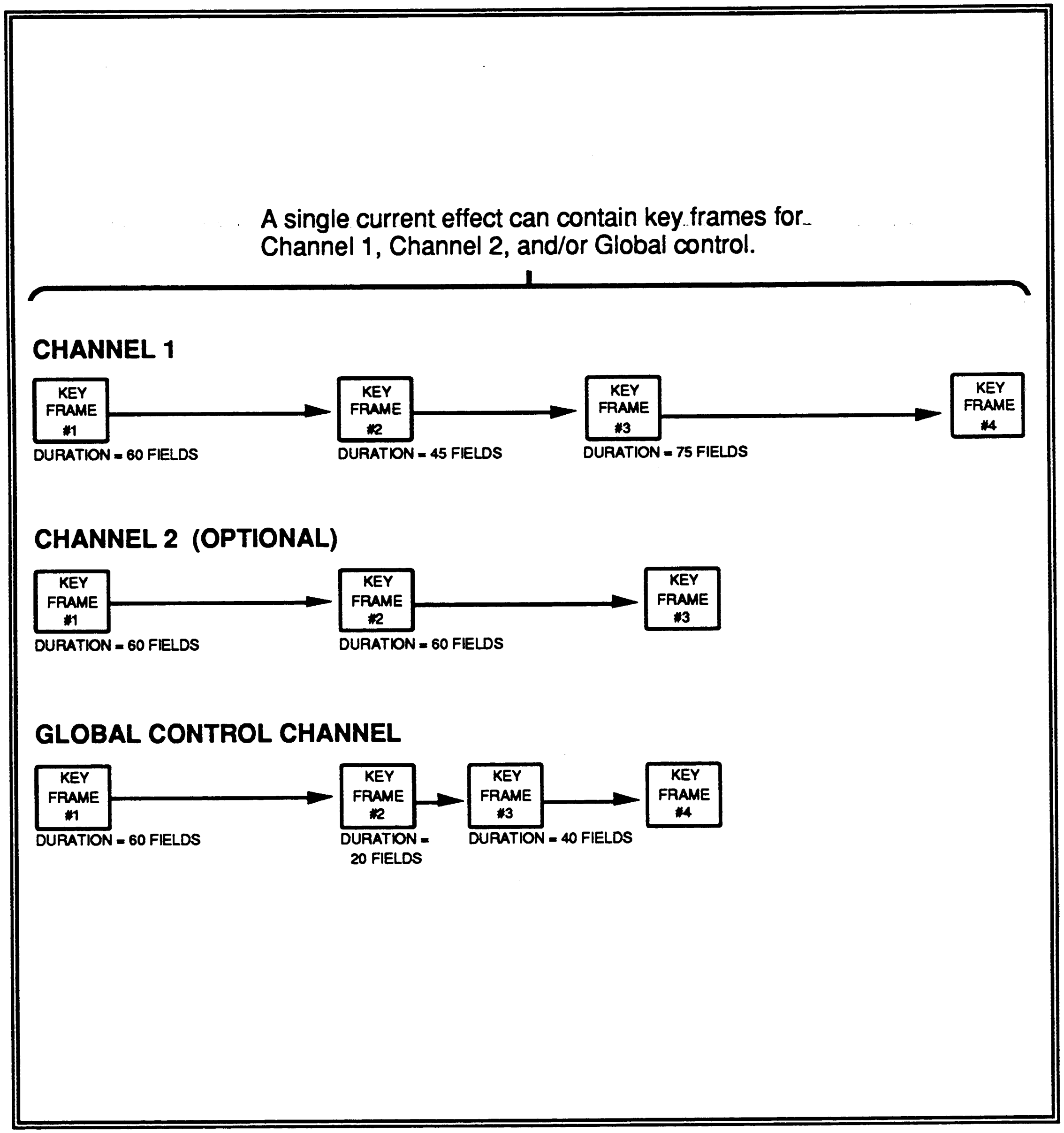
PICTURES MANIPULATED USING CHANNEL PARAMETERS.
CH 2
CH 1
GLOBAL CENTER OF ROTATION

Transform Parameters: *Each channel has its own separate set of transform parameters for spinning, orbiting, etc. The channels also share a third set of global transform parameters which can be used to manipulate both channels together, as if they were a single picture. For example, you can rotate both channel pictures together around the global center of rotation.*

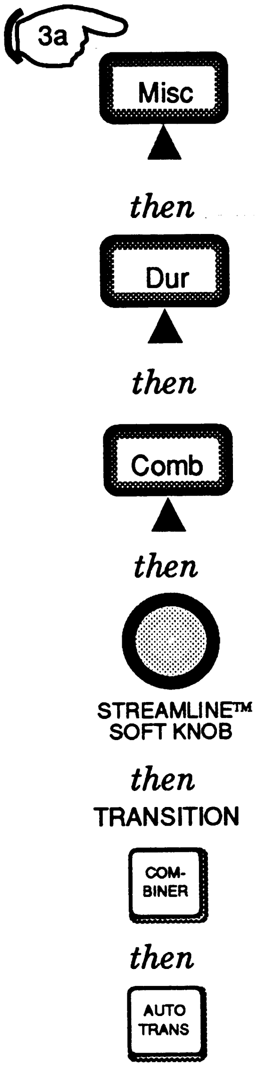
Key Frame Effects. When you delegate the panel to Channel 2, the KEYFRAME section is automatically delegated and will show the status of the Channel 2 key frames. You can use the KEYFRAME section to enter key frames for Channel 2 into the current effect.

However, even when the KEYFRAME section is delegated to Channel 2, it operates in conjunction with Channel 1 and with Global control because the same current effect can have key frames for Channel 1 and for Global, as shown in the picture on the following page. The three channels are separate but parallel; they all run together in the same time frame.

For details about how to set up multi-channel effects, please refer to the description of operations involving active, modify, and inactive channels in the "Basic Effects" section of this manual under the title "Using the Global Channel and Transforms."


A single current effect can contain key frames for Channel 1, Channel 2, and/or Global control.
CHANNEL 1
KEY FRAME #1
DURATION = 60 FIELDS
KEY FRAME #2
DURATION = 45 FIELDS
KEY FRAME #3
DURATION = 75 FIELDS
KEY FRAME #4
CHANNEL 2 (OPTIONAL)
KEY FRAME #1
DURATION = 60 FIELDS
KEY FRAME #2
DURATION = 60 FIELDS
KEY FRAME #3
GLOBAL CONTROL CHANNEL
KEY FRAME #1
DURATION = 60 FIELDS
KEY FRAME #2
DURATION = 20 FIELDS
KEY FRAME #3
DURATION = 40 FIELDS
KEY FRAME #4

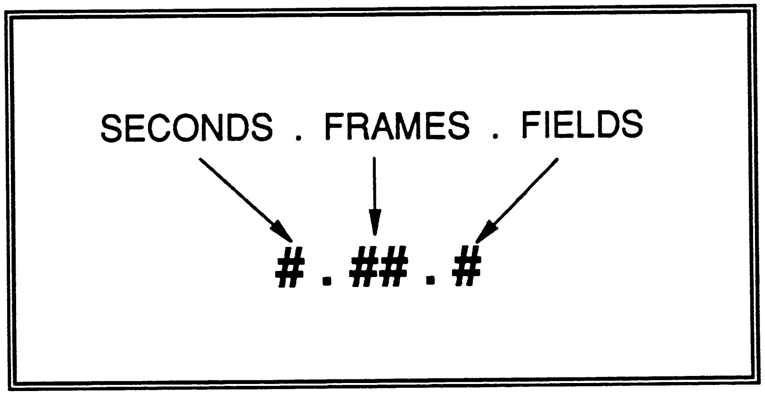
Key Frame Effects Using Multiple Channels: *A single current effect can contain key frames for both Channel 1 and Channel 2 and for global control of the two channels. The three channels are separate but they run together in the same time frame.*


3a
Misc
then
Dur
then
Comb
then
STREAMLINE™ SOFT KNOB
then
TRANSITION
COM-BINER
then
AUTO TRANS

3. **Combiner Transitions.** There are three ways to perform a combiner transition: an automatic transition, an instantaneous cut, or a manual lever transition.

***NOTE:** You can use combiner as part of a key frame effect by saving it as part of a key frame. You cannot save fade to black cuts, auto transitions, and lever transitions. Instead, you must set the duration of the key frame to determine the time it takes for the combiner function to be performed.*

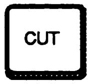
   a. Automatic Transition: Select {Misc} from the STREAMLINE™ Home Menu, then select {Dur}. Press {Comb}; this delegates the soft knob to adjust the duration of an automatic combiner transition. Turn the knob to enter a transition rate; the number in the DIRECT ENTRY display will represent the number of seconds, the number of additional frames, and the number of additional fields, separated by decimals, as shown below.


SECONDS . FRAMES . FIELDS
# . ## . #

Press [COMBINER] in the TRANSITION section. This delegates the [AUTO TRANS] pushbutton, the [CUT] pushbutton, and the lever arm in the TRANSITION section to the combiner. Press [AUTO TRANS] and a combiner transition will take place automatically at the programmed combiner transition rate.

3b

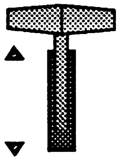
TRANSITION



b. Cut: Press [CUT]; a combiner transition will take place instantly.

3c

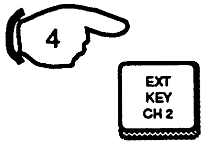
TRANSITION



c. Lever Transition: Using the lever allows you to vary the transition by changing speed or direction. Moving the lever from one limit to the other will perform one complete combiner transition.

Dedicated Key Channel Operations

In normal two-channel operation, both channels of the DPM-700 are used for video. However, you can also select either Channel 1 or Channel 2 to act as a dedicated key channel; the other channel will then provide the video fill.



4. Select [EXT KEY CH 2] in the KEYER section of the panel.In this mode, the system automatically uses Channel 2 as a dedicated key channel; Channel 1 provides the video fill.

NOTE: *You must have [COMBINER] selected in the output area to see this effect.*

Key Source Memory

Certain Keyer-section selections and parameters are saved in battery-backed-up RAM called Key Source Memory. Key-modes that are active when the DPM-700 is turned off will be active when the DPM-700 is turned on again. The selections affected and the factory default parameters are listed in the following table:

• Matte Fill	OFF
• Key Source (CH1, CH2, or Self)	None
• Linear Key	OFF (Luminance)
• Key Invert	OFF
• Clip	zero
• Gain	unity

NOTE: *Source memory sets these parameters on an input by input basis. If you set self key on an input and go to another input, you will call up the settings for that other input.*

LESSON 3-3:
USING AN OPTIONAL 10x1 INPUT SELECTOR OR A MODEL 200 AUX BUS TO SUPPLY INPUTS

Each DPM-700 channel comes with two standard inputs, A and B. You can increase the number of inputs per channel in two ways:

- Connect an optional TEN-X®L, DPM-733/733-2, or DPM-733CV/733CV-2 Input Selector to Input A of the channel. The ten new inputs (labeled A-J) are controlled using the DPM-700's STREAMLINE™ Effects Controller.

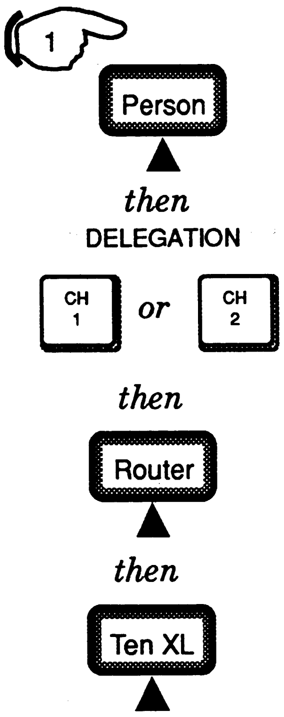
or

- Use any Model 200 Aux Bus to provide inputs to the DPM-700. This mode requires that the Model 200 have a software version which supports it.

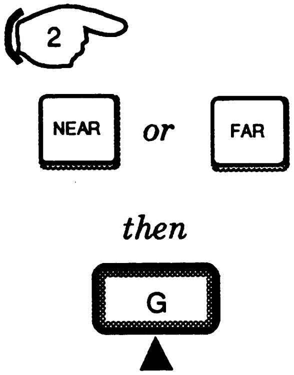
Each channel requires its own separate Input Selector or Aux Bus and they can be turned on/off on a per-channel basis.

Operating a 10x1 Input Selector

Once your 10x1 Input Selector is installed, you can use the DPM-700 control panel to operate it by remote control. The STREAMLINE™ menus allow you to turn the Input Selector(s) on/off and to select inputs for the DPM-700.



1. To turn on an Input Selector, select {Person} from the STREAMLINE™ menu. Input Selectors can be turned on and off for each channel separately.
   - On the control panel, delegate the panel to [CH 1]; "Ch 1" will appear in the top status line of the display. To turn on the Input Selector for Channel 1, select {Router} and then press {Ten XL} until the word appears in all capital letters, as follows: {TEN XL}.
   - Delegate the panel to [CH 2] and repeat the process.



2. You will use the Input Selector menu to select these new inputs, just as you did before to select standard inputs A and B; the menu will change automatically to show the new A-J inputs.
   - Press the [NEAR] or [FAR] pushbutton in the INPUT section of the control panel, depending on whether you want to assign an input's video to the near or far side of the DPM-700 picture. Use the soft pushbuttons below the menu to select the desired input; press {More} to alternate between Inputs A-E and Inputs F-J. For this lesson, press {G}.

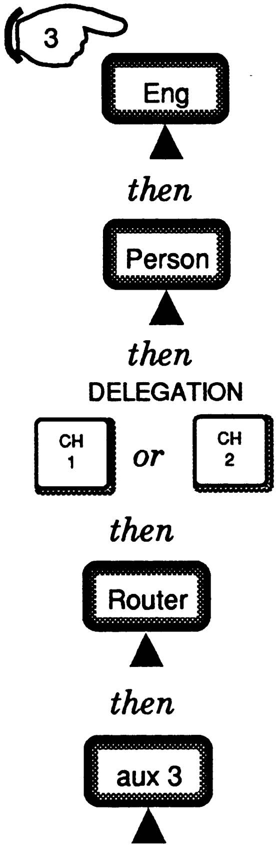
   The status line will show which inputs are selected as the near and far sides of a picture, just as it does when only the original two inputs (A and B) are active.

NOTE: *The two steps described above are the only differences in operation when the Input Selector option is installed. All other functions remain the same.*

Operating a Model 200 Aux Bus

If you have a Model 200 Aux Bus connected to your DPM-700, you can use the STREAMLINE™ menus to turn it on or off.

NOTE: You need to configure the ports to 200 operation in order to activate this feature.



3. To select a Model 200 Aux Bus to provide the DPM-700's inputs, press {Person}.

   Aux Buses can be selected for each channel separately.
   - On the control panel, delegate the panel to [CH 1]; "Ch 1" will appear in the top status line of the display. To select Aux Bus 3 as the channel's input source, press {Router} and then press {Aux 3} until the word appears in all capital letters: {AUX 3}.

     NOTE: *Normally this would be set as follows: Ch 1 = Aux 2; Ch 2 = Aux 3.*

4

NEAR or FAR

then use the Aux Bus control panel to select an input

4. Input selection is made from the Aux Bus control panel.

   To assign an input to the front or back of the picture, press the [FRONT] or [BACK] pushbutton respectively in the INPUT section of the control panel. Use the Aux Bus control panel to select an input.

   The status line will show which inputs are selected as the front and back of a picture, just as it does when only the original two inputs (A and B) are active.

Turning the Aux Buses on/off and selecting inputs from the Aux Bus control panel are the only differences in operation when a Model 200 Aux Bus is used as a DPM-700 input source. All other functions remain the same.

LESSON 3-4: SLAVE MODE WITH A MODEL 100/110 OR MODEL 200 SWITCHER

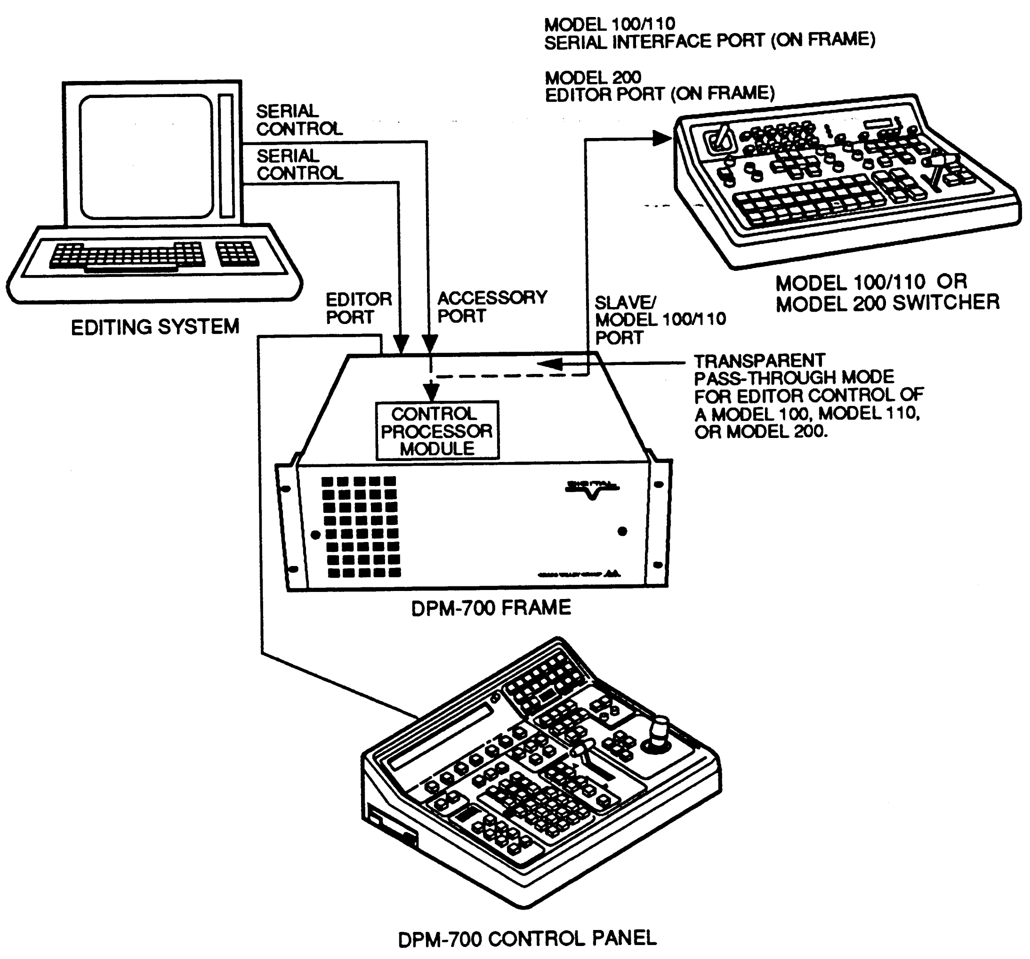
You can use your DPM-700 to control a Grass Valley Group Model 100/110 or Model 200 switcher in slave mode, either as a standalone device (no editor) or as part of an editing system.

NOTE: *A Composite Model 100/110 Switcher must have the Serial Interface Option installed.*

The Installation Section of the Service Manual describes how to set up the correct communications parameters for slave mode operation and enable the serial ports. The picture on the following page shows a sample configuration using a Model 100/110 Switcher.

The DPM-700 can control the following switcher functions:

- Model 100/110 or Model 200 E-MEM® registers can be saved/recalled using the DPM-700 control panel. (You can also store these registers on a DPM-700 disk, as described in the "Basic Effects" section of this manual.)
- Any of the switcher's E-MEM® setups can be recalled on a key frame basis.
- Fade to Black, Downstream Keyer and Automatic Transition events can be made part of a Global key frame in the DPM-700 and they will be triggered when the effect is run.

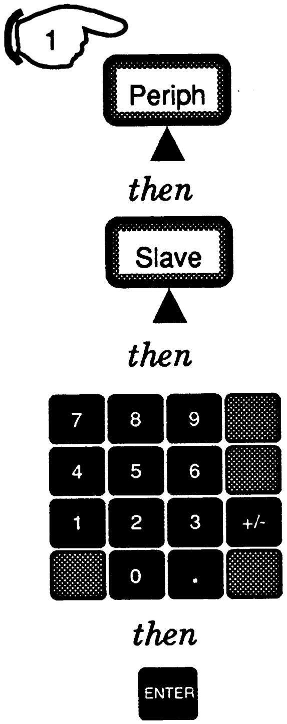

MODEL 100/110
SERIAL INTERFACE PORT (ON FRAME)
MODEL 200
EDITOR PORT (ON FRAME)
SERIAL CONTROL
SERIAL CONTROL
EDITING SYSTEM
EDITOR PORT
ACCESSORY PORT
SLAVE/ MODEL 100/110 PORT
MODEL 100/110 OR MODEL 200 SWITCHER
TRANSPARENT PASS-THROUGH MODE FOR EDITOR CONTROL OF A MODEL 100, MODEL 110, OR MODEL 200.
CONTROL PROCESSOR MODULE
DPM-700 FRAME
DPM-700 CONTROL PANEL

Slave Mode: *The DPM-700 can control either a Model 100/110 or a Model 200 switcher in slave mode. This allows you to synchronize DPM-700 and switcher functions.*

NOTE: In order to operate a Model 100/110 or Model 200 switcher in slave mode, the EDITOR ENABLE pushbutton on the switcher must be turned on.

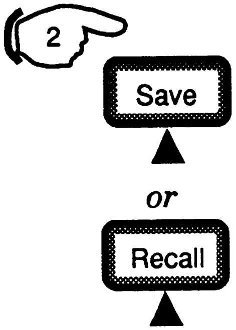
NOTE: ***Triggers and switcher recalls must be stored in Global Channel key frames.***

Saving and Recalling Switcher E-MEM® Registers



1. Select {Periph} and then {Slave} from the STREAMLINE™ menu.

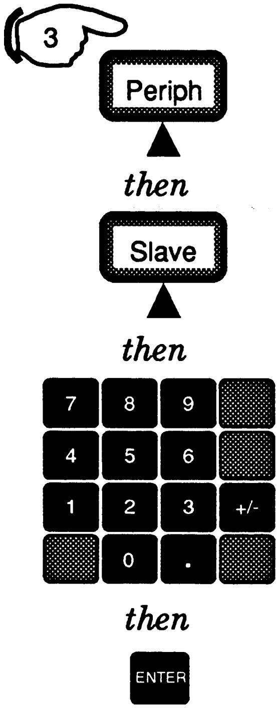
   Use the DIRECT ENTRY keypad to enter an E-MEM® register number for the switcher; the number will appear in the top line of the display.



2. Press {Save} to save the selected register into the switcher's effects memory space. Press {Recall} to recall a register which was previously saved.

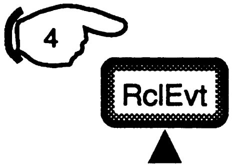
Recalling Switcher Setups

You can recall a switcher setup or "event" by learning it into one of the switcher's E-MEM® registers and then placing a command to recall that register into a DPM-700 effect's Global key frame. When the effect is run, the command will trigger and the switcher setup in the register will be recalled automatically.



3. Select {Periph} and then {Slave} from the STREAMLINE™ menu.

   Use the DIRECT ENTRY keypad to enter the number of the E-MEM® register you want to trigger.



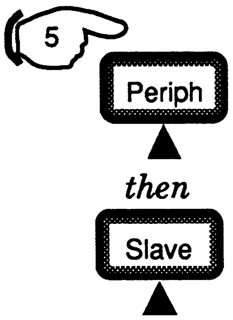
then store the working key frame into a DPM-700 effect.

4. Press {RclEvt} until the letters show as all capitals: {RCLEVT}. This activates the "Recall Event" command and makes it part of the working key frame.

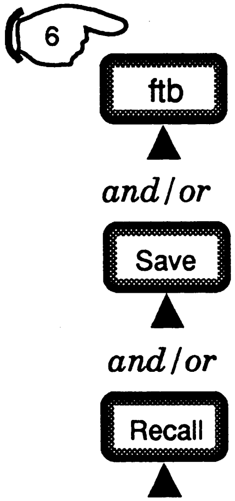
   Insert the Global Channel's working key frame into a DPM-700 effect. Now, whenever you run that effect, the Recall Event command will trigger when that key frame is run and will recall the switcher register at that point. (Remember that the switcher's EDITOR ENABLE pushbutton must be on.)

Controlling Switcher Transitions

You can control a switcher transition by placing a trigger command into a DPM-700 effect. When the effect is run, the trigger will fire and initiate the transition.

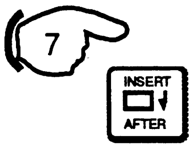


5. Select {Periph} and then {Slave} from the STREAMLINE™ menu.



6. Select the transition(s) you want to trigger (the choices in the menu will vary depending on which switcher you are using, as follows:
   - {prgcut} will trigger a program cut on the switcher (Model 100/110 and Model 200-1 only);
   - {prg_at} will trigger a program automatic transition (Model 100/110 and Model 200-1 only);
   - {dskcut} will trigger a downstream keyer cut (all switchers);
   - {dsk_at} will trigger a downstream keyer automatic transition (all switchers);
   - {me1cut} will trigger a Mix Effect 1 cut (Model 200-1 and Model 200-2 only);
   - {me2cut} will trigger a Mix Effect 2 cut (Model 200-2 only);
   - {me1_at} will trigger a Mix Effect 1 automatic transition (Model 200-1 and Model 200-2 only);
   - {me2_at} will trigger a Mix Effect 2 automatic transition (Model 200-2 only);
   - {ftb} will trigger a fade to black transition (all switchers).

   The menu words will appear in all capital letters when the triggers are active (the triggers are part of the Global working key frame).



then

EDITOR
ENABLE

then run the effect

7. Insert the working key frame into a DPM-700 effect. Now, whenever you run that effect, the transition command will trigger when that key frame is run. (Remember that the switcher's EDITOR ENABLE pushbutton must be on.)

NOTE: *The effect must be stored in key frame with [GLOBAL] channel delegated.*

Editor Control

A Model 100/110 or Model 200 switcher in slave mode can also be controlled by an editor which is connected to another of the DPM-700's serial ports, as shown in the picture on a previous page in this lesson.

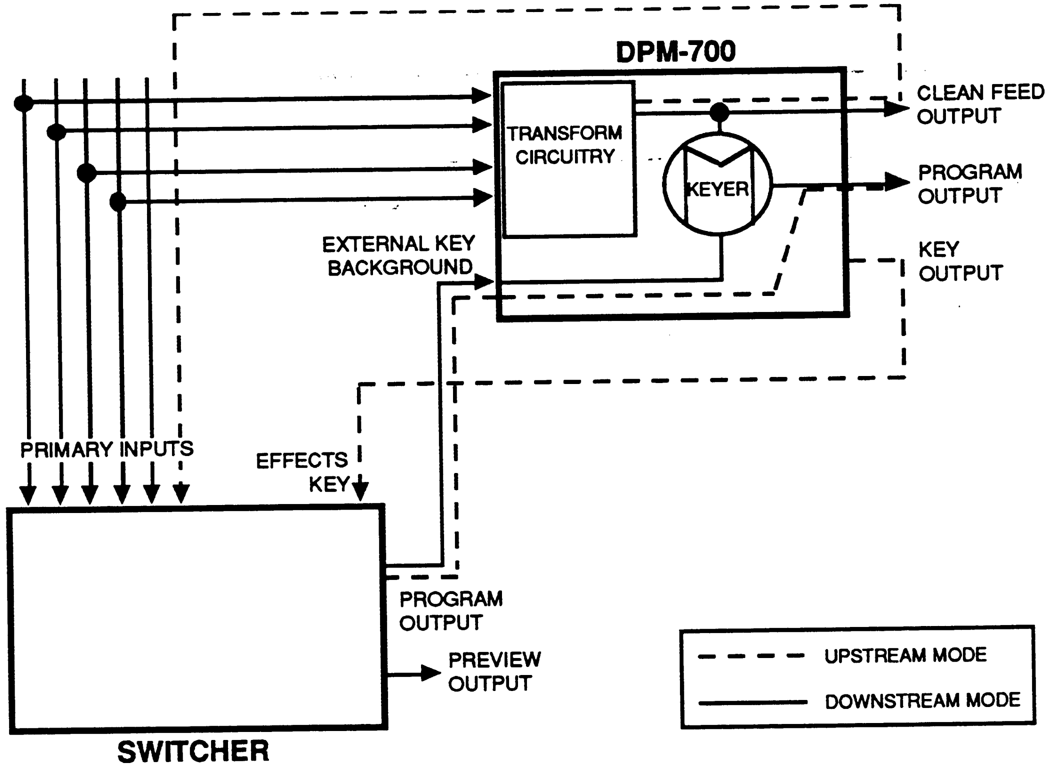
If you need detailed information about protocol characteristics and dialects for editor control, please refer to the *DPM-100/700 Digital Picture Manipulator Protocol Manual*, part number TP0463-00; this manual is available from Grass Valley Group.

LESSON 3-5:
KEYLAYER™ UPSTREAM/DOWNSTREAM MODE WITH A SWITCHER

The DPM-700 can be used with a switcher in both upstream and downstream mode, as shown in the picture on the next page.

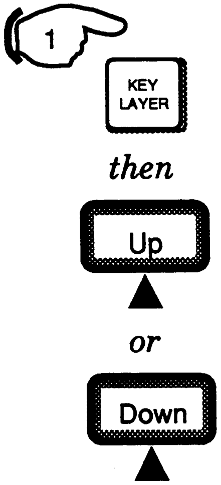
- In upstream mode, the DPM-700 is upstream of the switcher: the DPM-700's CLEAN FEED output is connected to one of the switcher's primary inputs and the DPM-700's KEY output feeds the effect key input.
- In downstream mode, the switcher's program output provides the EXTERNAL KEY BACKGROUND input for the DPM-700.

A special design feature allows you to use both modes without the trouble of reconnecting cables when switching from one to the other. That is, you can connect the cables for both upstream and downstream operation at the same time and switch between the two modes using software only; you do not need to recable each time you switch. The Installation Section of the System Manual tells you how to connect and time the system for both upstream and downstream mode.


DPM-700
TRANSFORM CIRCUITRY
KEYER
CLEAN FEED OUTPUT
PROGRAM OUTPUT
KEY OUTPUT
EXTERNAL KEY BACKGROUND
PRIMARY INPUTS
EFFECTS KEY
SWITCHER
PROGRAM OUTPUT
PREVIEW OUTPUT
UPSTREAM MODE
DOWNSTREAM MODE

KeyLayer™ Upstream/Downstream Mode: *You can connect the cables for both upstream and downstream operation at the same time and switch between the two modes using software only; the timing will adjust automatically.*

Selecting KeyLayer™ Upstream or Downstream Mode



1. To switch between the two modes, press [KEY LAYER]. A menu will appear which allows you to choose either upstream or downstream mode; one mode will always be selected.

   Select {Up} to operate the DPM-700 upstream from the switcher or {Down} to operate the DPM-700 downstream from the switcher.

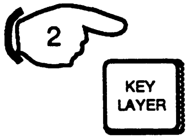
Storing KeyLayer™ Status in Key Frames

KeyLayer™ upstream/downstream status can be stored in individual key frames. For example, you could set up one key frame in an effect in upstream mode and the next in downstream mode; the DPM-700's timing will automatically adjust for the correct mode.

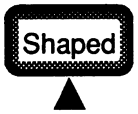
Upstream/Downstream is a global function. To store it, insert a key frame with global delegated as an active or modify channel.

Video Shaping in Upstream Mode

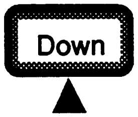
Normally the DPM-700's video signal is shaped as part of its processing. In upstream mode, this results in double-shaping with a switcher that has a linear keyer, since it also shapes the signal.



then



or



2. Video shaping is *on* in the default mode; to turn it off for upstream mode operation, press [KEY LAYER] and then select {Bkgnd}. Press {SHAPED} until the word appears in lower case letters, as follows: {Shaped}.

NOTE: *When working in upstream mode, if you are using the DPM-700 as a background source, you should turn shaping ON. If, however, you are using the DPM-700 as a key fill, you should turn shaping OFF.*

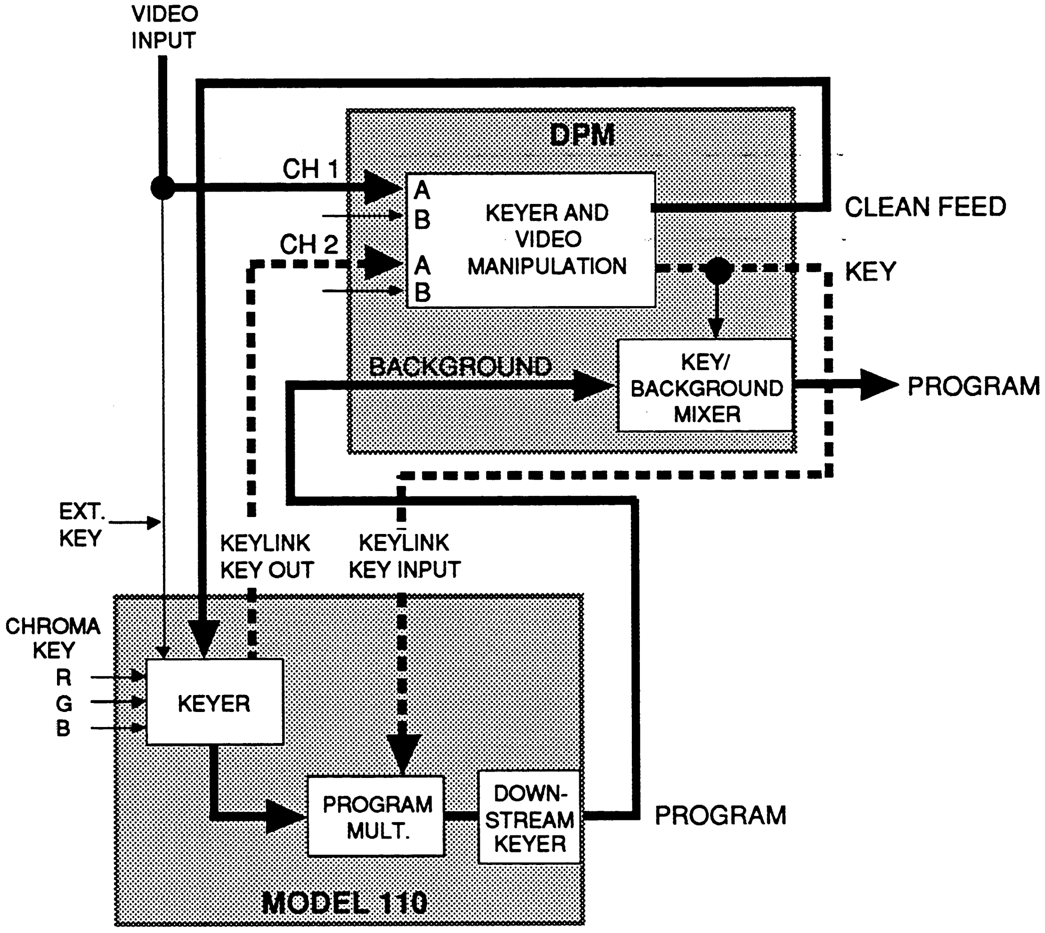
LESSON 3-6: KEYLINK™ MODE WITH A MODEL 110 SWITCHER

Grass Valley Group's Model 110 Production Switcher has a special KeyLink™ feature which allows an external key or a chroma key from the Model 110 to be sent out (via KEYLINK KEY OUT) to a DPM-700 for transformation. The transformed video is then returned to the Model 110 (via KEYLINK KEY INPUT), where it can be keyed in over the Program background and have a downstream key added by the Model 110. The picture on the following page shows a simplified diagram of KeyLink™ operation.

For complete details of installation and operation, please refer to the Model 110 *Service Manual* and *Operator Handbook*. NOTE: A Composite Model 110 must have the Serial Interface Option installed.

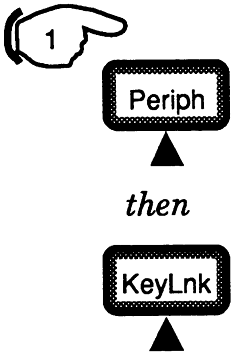
The DPM-700's software has been designed to operate closely with KeyLink™ by performing much of the setup for you automatically, with a single press of the {KeyLnk} pushbutton.

If desired, you can modify the programming for the {KeyLnk} pushbutton. For example, the factory default setup automatically selects crosspoint A on Channel 1 for the video input. You can change the programming so that a different crosspoint will be selected instead.


VIDEO INPUT
DPM
CH 1
CH 2
A
B
A
B
KEYER AND VIDEO MANIPULATION
CLEAN FEED
KEY
BACKGROUND
KEY/ BACKGROUND MIXER
PROGRAM
EXT. KEY
KEYLINK KEY OUT
KEYLINK KEY INPUT
CHROMA KEY
R
G
B
KEYER
PROGRAM MULT.
DOWN-STREAM KEYER
PROGRAM
MODEL 110

***KeyLink™ Video Path:** If you have a DPM-700 and a Model 110 connected as shown above (Upstream mode with KeyLink™), you can produce an external key or chroma key in the switcher, feed it to the DPM-700 via KeyLink™ for manipulation, and then bring it back into the switcher to key over Program. The switcher's PROGRAM output feeds through the DPM-700's BACKGROUND input to the DPM PROGRAM output.*

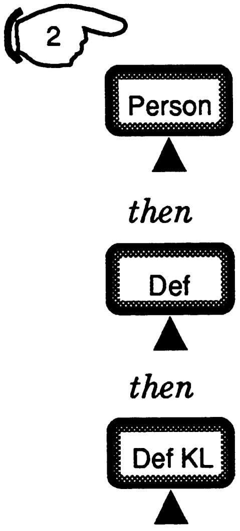
NOTE: *Before you turn on KeyLink™ mode in the DPM-700, make sure that (1) the Model 110's [EDITOR ENABLE] pushbutton is ON and;*
(2) the Model 110 is properly installed and enabled for Slave Mode operation with the DPM-700.



1. To turn on Model 110/DPM-700 KeyLink™ mode, press {Periph} in the DPM-700 STREAMLINE™ Home Menu. Then press {KeyLnk}. If you are using the factory default values, this will automatically set up the DPM-700 and the Model 110 as follows:
   - Sets the DPM-700's crosspoints to a defined input (factory default is Input A for both Channel 1 and Channel 2)
   - Selects Channel 2 to key Channel 1
   - Selects Upstream mode (this is necessary to turn off the KEY/BACKGROUND MIXER in the DPM-700)
   - De-selects {Shaped} in the DPM-700 KEYLAYER™ menu so that the video will be unshaped
   - Selects the linear keyer (you can set the keyer to unity gain by holding down the [LINEAR KEY] pushbutton for 1/2 second)
   - Delegates the DPM-700 to Channel 1 and Channel 2 and sets all transform values for Channel 2 (key) to be the same as Channel 1 (video) so the pictures will line up
   - Sends messages to the Model 110 which cause it to:
     1. Select a defined crosspoint on the KEY BUS (factory default is BLACK)
     2. Select the keyer for the next transition
     3. Turn on KeyLink™ (the selected KEY BUS pushbutton will blink)
     4. Select the key SOURCE (factory default is [EFF EXT])

You can make changes manually to any of the KeyLink™ parameter values using the DPM-700 and Model 110 control panels.

To turn KeyLink™ mode off, go to the Model 110 control panel and press any one of the four SOURCE pushbuttons *or* any one of the ten KEY BUS pushbuttons.



2. Three of the Model 110/DPM-700 default values listed on the previous page can be reprogrammed for automatic setup when you press {KeyLnk}, as follows:
   - DPM-700 input crosspoints: factory default is Input A for both Channel 1 and Channel 2, but you can select any available input, including those from the 10x1 Input Selector.
   - Model 110 KEY BUS crosspoint: factory default is BLACK, but you can select any crosspoint on the bus by pressing and holding the key source and then selecting the required crosspoint.
   - Model 110 key SOURCE: factory default is [EFF EXT]), but you can select [CHROMA KEY] instead.

To reprogram the default values, first set up the values you want on the DPM-700 and/or Model 110 control panels. Next, go to the Home Menu and press {Person} and then {Def}. To enter the new default values, press {Def KL}. As soon as you press it, the new values will become the setup values used whenever you press {KeyLnk}, as described in Step 1.

NOTE: *To restore the original factory default values, press {ClrKL} and then press {Def KL}.*

LESSON 3-7:
PERIPHERAL INTERFACE: GPI'S

The DPM-700 has General Purpose Interface (GPI) inputs and outputs which provide a simple way for the DPM-700 to control or be controlled by an external device. There are eight inputs and eight outputs.

- GPI inputs provide a way for an external device to trigger internal DPM-700 functions.
- GPI outputs provide a way for the DPM-700 to trigger external devices or to light tally lights.

GPI Inputs

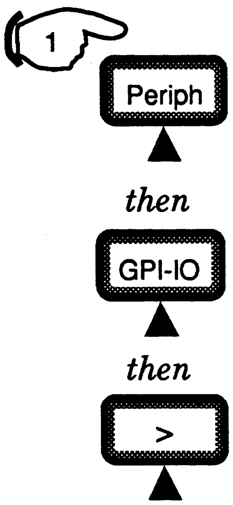
The GPI inputs are activated by applying a momentary contact closure between common and the desired GPI input connector or by using a trigger from an editor or other controlling device. Each GPI (numbered 0 through 7) corresponds to a pin on the GPI connector on the backplane of the DPM-700, as shown in the following table:

GPI #	Connector Pin
0	14
1	2
2	15
3	3
4	16
5	4
6	17
7	5

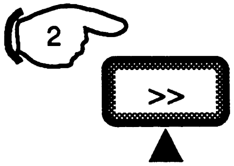
Refer to the DPM-700 System Manual for sample relay switch and editor connections.

To program and activate a GPI input takes four steps:

- Select the GPI input.
- Select the function you want to assign to the GPI input (if you plan to use the input to recall an E-MEM® register, you must also key in the register number).
- Enable the GPIs.
- Connect the GPI input's pin momentarily to common (pin 1).

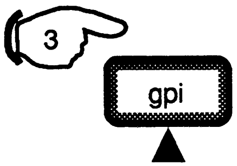


1. To select the GPI input, press {Periph} in the STREAMLINE™ Home Menu, then press {GPI-IO}. Press {<} or {>} until the GPI input you want to use appears in the top status line above the pushbuttons.



2. Press {<<} or {>>} until the function you want to assign to the GPI appears in the top status line. The possible choices are shown in the table on the following page.

NOTE: *If you want to program a GPI input to recall an E-MEM® register, select "Recall E-MEM: ##" as the function, then use the DIRECT ENTRY keypad to key in the desired bank / register number. The STREAMLINE™ display's status line will show that the number has been entered.*



3. Enable the GPIs. From the Home Menu, press {Periph}, then {Enabls}, then press {GPI} until it appears in all capital letters.

Connect the GPI input's pin to common.

4. To activate the programmed GPI input, connect its pin momentarily to Pin 1, the common input.

FUNCTION	DESCRIPTION
Recall E-MEM: ##	Recalls the selected register (use the DIRECT ENTRY keypad to enter the register number).
Fade Black	Causes the DPM-700 to execute a fade to black at the Fade to Black transition rate set on the control panel.
Cut Black	Causes an instantaneous cut to black.
Run Effect	Causes the DPM-700 to run the current effect.
Freeze Frame ch 1	Freezes the current Channel 1 video by storing one frame.
Freeze Frame ch 2	Freezes the current Channel 2 video by storing one frame.
Freeze Field ch 1	Freezes the current Channel 1 video by storing the same field twice as one frame.
Freeze Field ch 2	Freezes the current Channel 2 video by storing the same field twice as one frame.
Rewind Effect	Rewinds the current effect to its beginning.
Reverse Effect	Causes the current effect to run in reverse.
Next Keyframe	Moves the current effect to the next key frame.
Previous Keyframe	Moves the current effect to the previous key frame.
Advance One Frame	Moves the current effect forward one frame.
Reverse One Frame	Moves the current effect backward one frame.
Advance One Field	Moves the current effect forward one field.
Reverse One Field	Moves the current effect backward one field.
Fade Key ch 1	Fades the Channel 1 key on or off alternately at the Key transition rate set on the control panel.
Fade Key ch 2	Fades the Channel 2 key on or off alternately at the Key transition rate set on the control panel.
Cut Key ch 1	Cuts the Channel 1 key on or off instantaneously.
Cut Key ch 2	Cuts the Channel 2 key on or off instantaneously.
Fade Combiner	Performs a Combiner transition at the Combiner transition rate set on the control panel.
Cut Combiner	Causes an instantaneous Combiner transition.
Input Tally	Works in conjunction with the output tallies: when a GPI is enabled as a tally input, the tally output is logically combined with the input tally to produce a "true" on-air tally output.

GPI Outputs

There are two different types of GPI outputs: tallies and key-frameable triggers. The tallies can be used to light tally lamps or to provide status information to external devices. The triggers can be used to operate external devices such as character generators, cart machines, VTRs, etc.

Tallies. There are six tally outputs on the GPI connector on the backplane of the DPM-700. They function automatically as follows: When the tally function is active, an internal relay switch closes and connects the GPI pin to common (Pin 23). The GPI output remains connected to common as long as the function continues active.

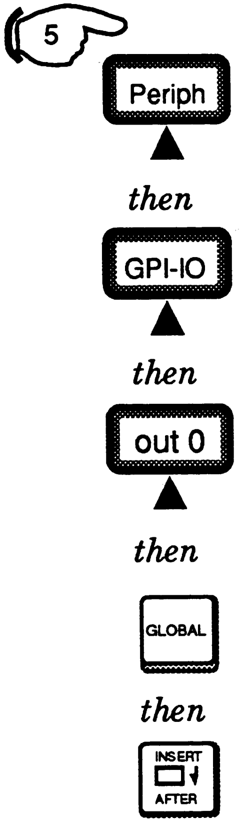
Pin #	Tally Function
19	Run
7	Fade to Black
20	Channel 2, Input B
8	Channel 2, Input A
21	Channel 1, Input B
9	Channel 1, Input A
24,25	Chassis ground
23	Common

Key-frameable Triggers. The two trigger outputs (numbered 0 and 1) can be stored in key frame effects so that they can be fired whenever the effect is run.

- Trigger output 0 is pin 10 on the GPI connector.
- Trigger output 1 is pin 22:

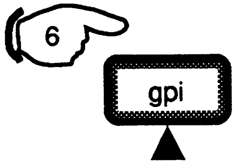
To store and activate a GPI key-frameable trigger output takes three steps:

- Store the GPI output as part of a key frame in a current effect. You can store both outputs at the same time if desired.
- Enable the GPIs.
- Run the effect which contains the trigger(s).



5. To select the GPI output(s) you want to store, press {Periph} in the STREAMLINE™ Home Menu, then press {GPI-IO}. Select {Out 0} and/or {Out 1}; the words will appear in all capital letters when they are selected.

   Make sure that [GLOBAL] is selected in the DELEGATION section of the panel. Press [INSERT BEFORE], [INSERT AFTER], or [REPLCE] to insert a global key frame into the current effect; the key frame will contain the selected trigger(s).



6. Enable the GPIs. From the Home Menu, press {Periph}, then {Enabls}, then press {GPI} until it appears in all capital letters.

Run the effect.

7. Run the effect. The trigger will fire automatically when the effect reaches the key frame containing the GPI trigger output.

LESSON 3-8:
USING THE OPTIONAL TTY TERMINAL

The DPM-700 has a TTY port which can be used to monitor the status of system operations and to perform some data entry and diagnostic functions. Any VT100 compatible terminal can be connected to the port, as described in the "Installation" section of the DPM-700 *Service Manual*.

The terminal can be accessed and controlled using either its own keyboard or the {Term} menu in the STREAMLINE™ display.

- To use the keyboard, type in the name of the desired display or function. (You can also type in "Help" to access an on-line help function.)
- To use the STREAMLINE™ menu display to control the terminal, press the soft pushbutton under the name of the display or function.

There are twelve different terminal sub-menu selections available; ten of these are used to call up status displays, as follows:

- {Pict} displays parameters for defocus, posterization, solarization, and color adjustment.
- {Trans} displays transform parameters, such as size, location, cursor location, rotation, spin, skew, and perspective.
- {Misc} displays transition duration rates, KeyLayer™, Channel/path enable, and Loop function status, and parameters for effect dissolve, perspective clip, recursive, and special effects.
- {Tline} calls up a two-part display. The top part shows three effect timelines, one for each channel. The bottom part shows the same three timelines, but has a special zoom-in function

which allows you to enlarge and monitor any desired section of the timeline. To do this, go to the point in time you want to monitor, select {zoom}, and use the soft knob to adjust the amount of enlargement.

- {Border} displays parameters for border and cropping.
- {Path} displays the Path menu parameters, as follows: Location/Center of Rotation, Rotation/Spin, Aspect/Skw, Post Transform, and Perspective.
- {Periph} calls up the Personality menu and Peripheral menu parameters. Personality parameters include router status, beeper, special modes, Lamp Saver, and Default. The Peripheral menu controls Slave mode, GPIs, Enables, and KeyLink™.
- {Std} allows you to check the status of video standards such as NTSC/PAL, etc.
- {Editor} displays parameters for Serial Interface.
- {Eng} parameters include setup, diagnostics, and software version.
- Tline display also shows how many key frames you have in the current effect and E-MEM® areas, and how much room is left over.

The final Terminal menu selection is {Auto}; this on/off pushbutton controls a function which will automatically call up the appropriate display for various different operations. For example, if {Auto} is on and you select the [LOCATE 3D] pushbutton, the Transform parameter display will automatically appear on the terminal screen.

The TTY terminal can also be used to enter data for disk and file names. You can enter a disk name from the keyboard whenever you perform a disk format or relabel operation. You can enter a file name when you perform disk saves and recalls.

Section 4
Dictionary Of Controls

This section of the manual lists each control on the DPM-700 panel alphabetically, including pushbuttons, knobs, displays, the lever, and the joystick. Controls which cannot be alphabetized, such as 0-9, are listed first. Names of pushbuttons are contained in square brackets: [PUSHBUTTON NAME].

Each listing for a control begins with a main heading in the left-hand column which gives the name of the control. The first entry in the right hand column, in parentheses, is the name of the control panel section where the control is located. Some control names are used in more than one section. In these cases, each section is given a separate listing under the main heading. Following the section name is a detailed description of how each designated control operates, including what it does, under what conditions it is active and/or appropriate, and its interaction with other controls.

At the end of this section you will find tree charts for the STREAMLINE™ menus: {Border}, {Disk}, {Eng}, {Input Selector}, {KeyLayer}, {Misc}, {Modify}, {Path}, {Periph}, {Person}, {Pict}, {Recursive}, {Sfx}, and {Term}.

MAIN HEADING	**(NAME OF SECTION where control is located) Description of how control operates.**
[0]-[9]	(DIRECT ENTRY section) The keypad in the DIRECT ENTRY section can be delegated to any of the following functions: • To move to a particular key frame in an effect (select [GOTO KF], key in the key frame number, press [ENTER]; • To set duration times for key frames (go to the key frame, select [KF DUR], key in the time, press [ENTER] and then press [REPLCE]); • To set duration times for an entire current effect (select [EFF DUR], key in the time, press [ENTER]); • To enter X, Y, and Z values for transform operations (select [X], [Y], or [Z], key in the value, press [ENTER]). • To enter values for various STREAMLINE™ menu functions.
	(E-MEM® section) The E-MEM® Effects Memory keypad is used to select registers for learning key frame effects and for running and/or recalling them later. • To Learn an Effect: select one or more [LEARN] pushbuttons, press BANK followed by the bank number, then press the register number. • To Run an Effect: make sure [RECALL TO CUR EFF] is not lighted; press a [RECALL] pushbutton, press BANK followed by the bank number, then press the register number. • To Recall an Effect into the Current Effect Space: select [RECALL TO CUR EFF], press BANK followed by the bank number, then press the register number.

[AUTO TRANS]

(TRANSITION section) The [AUTO TRANS] pushbutton can be delegated to either the Combiner, the Output Key, the Effect, or the Fade to Black function.

- If a [COMBINER] transition is selected, pressing [AUTO TRANS] will perform an automatic transition between the two channels; one channel will appear in front of the other. The transition will take place at the rate selected using the {Misc} Menu (select {Dur} and then {COMB} and use the soft knob or Direct Entry keypad to enter the desired rate). Note that this operation is meaningful only if the optional Second Channel is installed in the system.
- If an [OUTPUT KEY] transition is selected, pressing [AUTO TRANS] will perform an automatic transition of the key to insert it into or remove it from the PROGRAM and CLEAN FEED outputs, depending on its current status. The transition will take place at the rate selected using the {Misc} Menu (select {Dur} and then {KEY} and use the soft knob or Direct Entry keypad to enter the desired rate).
- If an [FTB] transition is selected, pressing [AUTO TRANS] will perform an automatic transition into or up from black, depending on the current status of the system. The transition will take place at the rate selected using the {Misc} menu (select {Dur} and then {FTB} and use the soft knob or Direct Entry keypad to enter the desired rate).

[AXIS LOCATE]

(TRANSFORM section) Selecting [AXIS LOCATE] allows you to relocate the axes (shown by the cursors) for the delegated channel(s).

[AXIS LOCK]

(TRANSFORM section) When [AXIS LOCK] is selected, the axes (shown by the cursor) for the delegated channel(s) will be locked to the picture and will be manipulated with it automatically. For example, if you move the picture, the axes will move in the same direction and by the same amount.

[BANK]	(E-MEM® section) There are ten different banks, numbered 0 through 9, in the E-MEM® Effects Memory system. Press [BANK], then the number of the bank you want. The bank number will be displayed as the left digit in the E-MEM® display.
[CH 1]	(DELEGATION section) Pressing [CH 1] delegates the control panel to Channel 1, the video channel which comes with a standard DPM-700. You can also manipulate the Channel 1 picture by selecting [GLOBAL] delegation and using the global transform parameters; these parameters apply to both the Channel 1 and (optional) Channel 2 pictures together. (OUTPUT section) Pressing [CH 1] selects Channel 1 as the output of the DPM-700 system.
[CH 2]	(DELEGATION section) Pressing [CH 2] delegates the control panel to Channel 2. You can also manipulate the Channel 2 picture by selecting [GLOBAL] delegation and using the global transform parameters; these parameters apply to both the Channel 1 and Channel 2 pictures together. (OUTPUT section) You must have the Second Channel option installed in order to use this pushbutton. Pressing [CH 2] selects Channel 2 as an output of the DPM-700 system.
[CLEAR]	(DIRECT ENTRY section) Press CLEAR to erase data that you have keyed in but do not want to enter. If you have not started to enter a value, pressing "Clear" will key in the default value for the parameter selected.
[CLEAR WORKNG KF]	(KEYFRAME/EDIT section) The working key frame is a memory buffer which holds the parameters for a single key frame picture. Whenever you use the control panel to set up or to change a key frame, these changes take place in the working key frame buffer. Also, as you move through a key frame effect which is in the

current effect space, a copy of the currently selected point in the effect is automatically placed in the working key frame buffer.

- Pressing [CLEAR WORKNG KF] sets the transform parameters of the working key frame back to a set of user default values for those channels selected under DELEGATION. These default values are saved as part of Personality (listed under the {Person} menu). If the user has not entered any values, the user default values will be the same as the default values which were set at the factory.
- Holding down [CLEAR WORKNG KF] for 1/2 second sets all of the parameters of the working key frame back to their user default values for those channels selected under DELEGATION except for input selection and keyer values.

Note that clearing the working key frame will not change the current effect in any way. To change the current effect, you must use the KEYFRAME EDIT pushbuttons to restore, replace, delete, or insert a key frame.

Key frames which are cleared are stored in a special memory space until you perform another [CLEAR WORKNG KF] or [DELETE] operation. This allows you to undo a [CLEAR WORKNG KF] operation by pressing the [RESTOR WORKNG KF] pushbutton. You can also use the clear/restore functions to duplicate a key frame and insert it elsewhere in the effect:

- Go to a key frame and press [CLEAR WORKNG KF] to place a duplicate of the key frame into memory.
- Move to another place in the effect and press [RESTOR WORKNG KF] to restore the cleared key frame to the working key frame buffer.
- Press [INSERT BEFORE], [INSERT AFTER], or [REPLCE] to insert the key frame into the effect in its new location.

CLIP knob

(KEYER section) The CLIP control knob sets the dc reference level which will be compared to the luminance level of the key source for luminance and linear keys. Wherever the key source level is greater than the clip reference level, a "hole" will be cut in the background so that key fill video can be inserted.

The same CLIP knob is used for both luminance and linear keys, depending on panel delegation. The knob is delegated to luminance key when [SELF KEY] is on and [LINEAR KEY] is off; it is delegated to linear key when [SELF KEY] is and [LINEAR KEY] are both on.

Adjusting the clip level changes the key hole shape. Turning the knob counterclockwise lowers the clip reference level and makes the hole larger. At the knob's full counterclockwise setting, the key fill signal will fill the entire screen.

[COMBINER]

(OUTPUT section) This pushbutton is not used unless the optional Second Channel and combiner is installed in the system. When [COMBINER] is selected, the system output will be a combination of Channel 1 and Channel 2. The [AUTO TRANS] and [CUT] pushbuttons in the OUTPUT section will be active and will perform combiner transitions.

(TRANSITION section) This pushbutton is not used unless the optional Second Channel is installed in the system. Selecting [COMBINER] delegates the [AUTO TRANS] and [CUT] pushbuttons and the lever to the combiner function, as follows:

- Pressing [AUTO TRANS] will perform an automatic transition between the two channels; one channel will appear in front of the other. The transition will take place at the rate selected using the {Misc} menu (select {Dur} and then {COMB} and use the soft knob or Direct Entry keypad to enter the desired rate).
- Pressing [CUT] performs an immediate transition between the two channels.

- Moving the lever will perform a transition between the two channels.

Control knob

See CLIP knob, GAIN knob, STREAMLINE™ knob.

[CUT]

(TRANSITION section) The [CUT] pushbutton is used to perform an immediate transition between two states, as follows:

- Pressing [CUT] when the optional Second Channel is installed in the system and the [COMBINER] pushbutton is selected performs an immediate transition between the two channels.
- Pressing [CUT] when the [OUTPUT KEY] pushbutton is selected performs an immediate transition of the key, inserting the key into the background or removing it, depending on its current state.
- Pressing [CUT] when the [FTB] pushbutton is selected performs an immediate transition into or up from black, depending on the current state of the system.

[DELETE]

(KEYFRAME/EDIT section) Pressing [DELETE] removes a key frame, including its duration, from the current effect. Note that you must be actually on a key frame in order to delete it; the pushbutton is inactive when you are between key frames. To go to a key frame, press [GOTO KF], then the number of the key frame, then [ENTER].

You can undo a delete up to the point where you perform another [DELETE] or a [CLEAR WORKNG KF]. Until then, the data for the deleted key frame is stored in a special memory space. Press [RESTOR WORKNG KF] to restore the deleted data to the working key frame area. Press [INSERT AFTER], [INSERT BEFORE], or [REPLCE] to insert the working key frame into the current effect, either in the same place it was before or in a new location.

You can use the undo function to move a key frame to a different place in the effect, as follows:

- Go to a key frame and press [DELETE] to delete the key frame and place it into memory.
- Move to another place in the effect and press [RESTOR WORKNG KF] to restore the deleted key frame to the working key frame buffer.
- Press [INSERT BEFORE], I[INSERT AFTER], or [REPLCE] to insert the key frame into the effect in its new location.

[DETENT]

(DIRECT ENTRY section) The detent function is a quick way of rounding off X, Y, or Z values for transform functions. That is, it changes the value to the nearest of a group of preselected values. As an example, if X = 1.8 for a location transform, you could use the detent function to change it to X = 2, the nearest detent value. To use detent, first select a pushbutton in the TRANSFORM section, then select [X], [Y], or [Z] and press [DETENT]. The new value will be shown in the DIRECT ENTRY display.

Display

(DIRECT ENTRY section) This display shows the current values for various transform and effect parameters. Parameters are chosen for display using the STREAMLINE™, TRANSFORM, and/or [X], [Y] and [Z] pushbuttons; the current display delegation is shown in the upper right-hand corner of the STREAMLINE™ display.

(E-MEM® section) The left digit of the E-MEM® display shows the number of the bank you are currently using for learn and/or recall operations; the banks are numbered 0 through 9. The right digit shows the most-recently-selected register number; the registers are numbered 0 through 9.

(KEYFRAME section) When you have an effect in the key frame current effect space, this display shows which key frame in the effect is currently selected. For example, if you are on Key Frame #2 or at a point between Key Frame #2 and Key Frame #3, the display will show the number "2."

(STREAMLINE™ section) This display gives you status information and prompts for STREAMLINE™ programs. The display is used to label the "soft" pushbuttons and the "soft" knob with their current functions.

[EFF DUR] (DIRECT ENTRY section) Select this pushbutton to change the time for the overall duration of the effect in the key frame current effect space. Note that the duration of each individual key frame in an effect will be adjusted in proportion to the overall change. To enter the effect duration, press [EFF DUR], enter the desired time, press [ENTER].

[EFFECT] (EFFECT section) Selecting [EFFECT] delegates the lever to the key frame effect function. When [EFFECT] is selected, moving the lever will perform the effect manually. Moving the lever from one limit to the other will perform one complete effect unless [STOP/NEXT] is selected; in that case, each complete lever movement will step the effect through one key frame.

[ENTER] (DIRECT ENTRY section) Pressing [ENTER] confirms data entry in the DIRECT ENTRY section of the panel. Enter can also be used while "ModAll" is on to produce an absolute Modall instead of a relative Modall.

[EXT KEY CH 1] (KEYER section) When [EXT KEY CH 1] is selected, Channel 1 will be used as a dedicated key channel (or input key-source). This pushbutton is only used when you have the optional Second Channel installed.

- If [SELF KEY], [EXT KEY CH1], or [EXT KEY CH2] are off, the keyer will produce a key that uses the entire manipulated picture (the raster) for the key signal. The KEYER CLIP and GAIN controls have no effect on the raster key.
- If [EXT KEY CH 1] is selected, the keyer will produce a luminance or linear key, depending on

whether the [LINEAR KEY] pushbutton is selected:

- If [LINEAR KEY] is on, the keyer will produce a linear key. Linear keys are a special kind of luminance key and are described in detail under the " [LINEAR KEY]" entry in this dictionary.
- If [LINEAR KEY] is off, the keyer will produce a luminance key. For a luminance key, the fill video is inserted over the background video wherever the key source luminance level is higher than a clip reference level set by the operator. Luminance keys are recommended instead of linear keys when the key source signal needs shaping to avoid a mock-banding effect on the edges of the key.

The CLIP and GAIN control knobs are used for both luminance and linear keys, but the values for each are stored separately. The controls are delegated to luminance key whenever [SELF KEY], [EXT KEY CH1], or [EXT KEY CH2] is on and [LINEAR KEY] is off. In luminance key mode, the controls operate as follows:

- The CLIP control knob sets the dc reference level which is compared to the key luminance source; a "hole" will be cut in the background wherever the key level is greater than the clip reference level. Adjust the CLIP control knob for the desired key hole shape. The clip range is from 0 to 110 IRE units. Turning the knob counterclockwise lowers the clip reference level. At its full counterclockwise setting, the key will be full-on.
- The GAIN control determines the transparency of the image. For a luminance key, the gain range is 0 to 130 in NTSC systems. As gain increases, transparency of the key will decrease.

[EXT KEY CH 2]

(KEYER section) When [EXT KEY CH 2] is selected, Channel 2 will be used as a dedicated key channel (input key-source). This pushbutton is only used when you have the optional Second Channel installed.

The linear and luminance key information under [EXT KEY CH1] above is the same for [EXT KEY CH2].

[FAR]

(INPUT section) Press [FAR] and then select an input; that input will be assigned to the far side of the DPM-700 picture on the delegated channel(s).

- If you are using the standard A/B inputs or a 10x1 input router, the appropriate Input Selector menu will appear in the display automatically when you press [FAR].
- If you are using a Model 200 Aux Bus as an input selector, use the Aux Bus control panel to select the input.

[FTB]

(TRANSITION section) Selecting [FTB] delegates the [AUTO TRANS] and [CUT] pushbuttons and the lever to the fade to black function, as follows:

- Pressing [AUTO TRANS] will perform an automatic transition into or up from black, depending on the current status of the system. The transition will take place at the rate selected using the Misc Menu (select {Dur} and then {FTB} and use the soft knob or Direct Entry keypad to enter the desired rate).
- Pressing [CUT] performs an immediate transition into or up from black, depending on the current state of the system.
- Moving the lever will fade the system into or up from black, depending on its current state. Moving the lever from one limit to the other will perform one complete fade.

The fade to black function is always active and available, even when a key frame effect is running. Fade to black states can also be stored in key frames and run automatically as part of an effect.

GAIN knob

(KEYER section) The GAIN control knob is used for both luminance and linear keys. The knob is delegated to luminance key when [SELF KEY] is on and [LINEAR KEY] is off; it is delegated to linear key when [SELF KEY] and [LINEAR KEY] are both on.

Gain determines a key's edge sharpness—that is, the speed at which the picture changes between the background and the key fill signals. When gain = 1, the key edge will be exactly the same as the input signal. As gain increases, the change takes place more slowly and the two signals will appear more mixed (softer) at the point of transition. For a luminance key, gain can be very high or can approach linear. For a linear key, gain has a comparatively small range which includes true linearity (unity, or gain = 1). Turn the GAIN knob clockwise to increase the gain.

[GLOBAL]

(DELEGATION section) Global refers to global control, a feature which allows you to perform transforms using a set of global parameters which are different from the channel parameters. This extra set of transform parameters allows you to create complex movements and effects. For example, you could spin and orbit a picture using the Channel 1 parameters. You could then orbit this spinning-and-orbiting picture around a different, global center of orbit.

If you have the optional Second Channel in your system, global control allows you to manipulate the two channels together, as if they were a single picture.

[GOTO KF]

(DIRECT ENTRY section) If you have an effect in the current effect space, use this pushbutton to go to a particular key frame in the effect. Press [GOTO KF], key in the key frame number, and press [ENTER].

[HOME/EXIT]

(STREAMLINE™ section) Pressing this pushbutton exits the menu you are in and moves to the menu one level higher. Holding the pushbutton down for 1/2 second returns you to the top-level Home Menu.

[INSERT AFTER]

(KEYFRAME/EDIT section) This pushbutton is active at all times.

- If you are directly on a key frame, pressing [INSERT AFTER] will insert the working key frame into the effect immediately after the key frame you are on.

The new key frame will have the same duration as the key frame immediately before it.

- If you are not on a key frame, [INSERT AFTER] functions as an "INSERT" pushbutton; pressing it will insert the working key frame into the current effect at that point. The new key frame will not have a default duration of its own; it will divide the original duration in proportion to its location between the two original key frames.
- If you don't have an effect in the current effect space), pressing [INSERT AFTER] will enter the working key frame into the current effect as Key Frame #1. This key frame will have a default duration of 60 fields (50 for PAL).

[INSERT BEFORE]

(KEYFRAME/EDIT section) This pushbutton is active when you have an effect in the current space and you are directly on a key frame. Pressing [INSERT BEFORE] will insert the working key frame into the effect immediately before the key frame you are on. The new key frame will have the same duration as the key frame immediately before it.

Joystick

(TRANSFORM section) The joystick is used to enter values for transform parameters. It has three different control modes: you can move the lever left/right (X values), forward/backward (Y values), or you can rotate the knob (Z values). These are the same as the [X], [Y], and [Z] values in the DIRECT ENTRY keypad section.

[KEY INVERT]

(KEYER section) Selecting [KEY INVERT] inverts the key signal and allows you to key from a black-on-white source instead of a white-on-black source. That is, the key source video will be inserted over the background video wherever the original key source signal's luminance level is lower than the clip reference level.

[KEY LAYER]

(STREAMLINE™ DIRECT section) Pressing this pushbutton will immediately bring up the KeyLayer™ Menu in the STREAMLINE™ display. This menu contains selections for the following functions:

	• Upstream/downstream mode, which allows you to select whether the DPM-700 is operating upstream or downstream of the switcher. • Key Matte Fill adjustments for luminance, saturation and hue. • Background selections for either External or Matte, shaping on/off, and Background Matte adjustments for luminance, saturation and hue.
Keypad	(DIRECT ENTRY section) See the entries for 0-9, CLEAR, DETENT, ENTER, and TRIM. The keypad pushbuttons are described in detail under these individual entries. (E-MEM® section) See the entry for [0]-[9]. Also see [BANK], [LAST X], [LEARN], [RECALL], and [RECALL TO CUR EFF] for details about pushbuttons which work with the E-MEM® keypad.
[KF DUR]	(DIRECT ENTRY section) Select this pushbutton to change the duration time for a key frame in the current effect. 1. Go to the key frame. press [GOTO KF], then the number of the key frame, then [ENTER]. 2. Key in the new time as: seconds, decimal point, frames; press [ENTER]. (You can also key in the time as frames-only by leaving out the decimal point; the DPM-700 will automatically convert the number of frames into seconds, decimal point, frames.) 3. Use [INSERT BEFORE], [INSERT AFTER], or [REPLCE] to insert the key frame with its new duration time into the current effect. To set the overall duration of an entire key frame current effect, see [EFF DUR].
Knob	See CLIP knob, GAIN knob, STREAMLINE™ knob.
[LAST X]	(E-MEM® section) This pushbutton provides an "undo" function for your most recent E-MEM® [LEARN] or [RECALL TO CUR EFF] operation.

- Performing a learn into a register erases any data which was previously learned into that register. To retrieve the erased data (undo the learn), press [LAST X].
- Performing a [RECALL TO CUR EFF] operation erases the current effect. To retrieve the erased data (undo the recall to current effect), press [LAST X].
- Pressing Last X after a ModAll operation undoes the ModAll.

[LEARN]

(E-MEM® section) A learn operation stores the key frame effect which is in the current effect space into an E-MEM® register. There are three [LEARN] pushbuttons; you can select one, two, or all three of them at the same time. To select all three at once, hold down the [LEARN CH 1] pushbutton for 1/2 second.

- Select [LEARN CH 1] to learn only the Channel 1 current effect parameters ;
- Select [LEARN CH 2] to learn only the Channel 2 current effect parameters ;
- Select [LEARN GLOBAL] to learn only the global control current effect parameters. Note that many important effect parameters, such as Background Colors and Key Background selection, are learned as part of Global key frames and not on a per-channel basis; it is good practice to select Global delegation whenever you learn a key frame.

After you perform a learn, the [LEARN] pushbutton(s) will go dark and the corresponding [RECALL] pushbutton(s) will light.

To undo a [LEARN] operation, see the [LAST X] entry.

Lever

(TRANSITION section) The lever is used to manually perform a transition or to run the current effect. Four pushbuttons—[COMBINER], [OUTPUT KEY], [EFFECT], and [FTB]— are used to delegate the lever to the desired function as follows:

- [COMBINER]: This pushbutton is active only if the optional Second Channel is installed in the system. When [COMBINER] is active, the lever will perform a manual transition between the two channels. Each movement of the lever from one limit to the other performs one complete transition.
- [KEY]: The lever will perform a manual transition which will insert the key over the PROGRAM output background or remove it, depending on its current state. Each movement of the lever from one limit to the other performs one complete transition.
- [EFFECT]: Moving the lever will cause the current effect to run under manual control. In normal mode ([STOP/NEXT] off), each movement of the lever from one limit to the other performs the entire current effect once. When [STOP/NEXT] is selected (lighted), each movement of the lever from one limit to the other will step through one key frame of the effect. Note that you can change the direction of the lever between limits and move it forward and backward; the effect will then run forward and backward.
- [FTB]: The lever will perform a manual transition which will fade the system into or up from black, depending on its current state. Each movement of the lever from one limit to the other performs one complete transition.

[LINEAR KEY]

(KEYER section) When this pushbutton and [SELF KEY], [EXT KEY CH1], or [EXT KEY CH2] are selected, the keyer will produce a linear key. A linear key, unlike a luminance key, does not shape the key source signal. At unity gain (gain = 1), a linear key's edge will have exactly the same shape and softness as the key source input. Linear keys are used when the key-source video has been pre-shaped and requires little or no further shaping by the DPM-700 keyer.

The CLIP and GAIN control knobs are used for both luminance and linear keys, but the values for each are stored separately. The controls are delegated to linear key whenever [LINEAR KEY] is selected for input keying.

- The CLIP control knob sets the dc reference level which is compared to the key source luminance level; a "hole" will be cut in the background wherever the luminance level is greater than the clip reference level. Adjust the CLIP control knob for the desired key hole shape. The clip range is from 0 to 110 IRE units. Turning the knob counterclockwise lowers the clip reference level. At its full counterclockwise setting, the video fill signal will fill the entire screen.
- The GAIN control determines the strength of the key signal. The gain range is 0 to 130 in NTSC systems. At unity gain (gain = 1), the key edge will have the same as the key source input signal; this is a true linear key, although the DPM-700 allows gain to be adjusted over a wider range. As gain decreases, edge softness will also increase because the change between the background and key fill signals will take place more slowly, with more mixing of the two signals at the point of change.

For more details about luminance and self keys, please refer to the "[SELF KEY]" entry in this dictionary.

[LOCATE 3D]

(TRANSFORM section) Selecting this pushbutton delegates the joystick and the DIRECT ENTRY keypad to the locate function and allows you to move the picture anywhere in 3D space.

- To move the picture along the X axis of the screen, move the joystick left or right or select [X] in the DIRECT ENTRY section, key in a value, and press [ENTER]. You can move the picture off-screen.
- To move the picture along the Y axis of the screen, move the joystick forward or backward or select [Y] in the DIRECT ENTRY section, key in a value, and press [ENTER]. You can move the picture off-screen.
- To move the picture closer to or further from the front plane of the screen along the Z axis, turn the joystick knob or select [Z] in the DIRECT ENTRY

section, key in a value, and press [ENTER]. Note that although the picture will appear larger when it is moved closer, this is not a true size function; always use the [SIZE] pushbutton to adjust the picture's size. Using the Locate function instead of the Size function could produce unexpected results when you manipulate pictures in 3D space, especially in regard to picture priority (which picture is in front of the other) or when used in source mode.

[LOCATE 3D], [ROT 3D], [SPIN], [AXIS LOCATE], [POST], [SKEW], [SIZE], and [PERSP] are all mutually exclusive pushbuttons; one will always be on, but never more than one.

Luminance Key

See [SELF KEY].

[MATTE FILL]

(KEYER section) When the [MATTE FILL] pushbutton is selected, the key will be filled with a solid matte color generated by the DPM-700. (When [MATTE FILL] is off, the key fill will be the manipulated input video.)

To adjust the matte fill color, press [KEY LAYER] to bring up the KeyLayer™ STREAMLINE™ menu and then select {Keymat} from the menu. The next menu which appears lets you select luminance, saturation, or hue for adjustment. Press {Luma}, {Sat}, or {Hue}, respectively, and use the STREAMLINE™ soft knob to make the adjustment. Note that this matte generator is separate from the background matte generator; matte fill and matte background must be adjusted independently.

[MODIFY]

(STREAMLINE™ DIRECT section) Pressing this pushbutton will immediately bring up the Modify Menu in the STREAMLINE™ display. This menu contains selections for the following functions:

- Modify All, which allows you to adjust all key frames in an effect in the same way and at the same time.
- Copying an effect from one channel to the other channel.
- Copying the working key frame from one channel to the other channel.
- Saving the working key frame into a buffer (it can be restored later in the same place or in a different place in the effect).

[NEAR]

(INPUT section) Press [NEAR] and then select an input; the selected input will be assigned to the near side (facing the viewer) of the DPM-700 picture on the delegated channel(s).

- If you are using the standard A/B inputs or a 10x1 input router, the appropriate Input Selector menu will appear in the display automatically when you press [NEAR].
- If you are using a Model 200 Aux Bus as an input selector, use the Aux Bus control panel to select the input.

[NEXT]

(KEYFRAME section) Pressing [NEXT] moves you immediately to the next key frame in the effect sequence. The [NEXT] pushbutton will be lighted to show that the function is active. If you are on the last key frame, [NEXT] will be inactive.

[OUTPUT KEY]

(TRANSITION section) Selecting [OUTPUT KEY] delegates the [AUTO TRANS] and [CUT] pushbuttons and the lever to the keyer function, as follows:

- Pressing [AUTO TRANS] will perform an automatic transition of the key to insert it into or remove it from the PROGRAM and CLEAN FEED outputs, depending on its current status. The transition will take place at the rate selected using the Misc Menu (select {Dur} and then {KEY} and use the soft knob or Direct Entry keypad to enter the desired rate).
- Pressing [CUT] performs an immediate transition of the key, inserting the key into the background or removing it, depending on its current state.

- Moving the lever will bring the key on over the background or will remove it from the background, depending on its current state. Moving the lever from one limit to the other will perform one complete key transition.

[PERSPECTIVE]	(TRANSFORM/SECONDARY TRANSFORMS section) Selecting this pushbutton delegates the joystick and the DIRECT ENTRY keypad to the perspective function and allows you to adjust the amount of perspective and the vanishing point.
[POST XFORM]	(TRANSFORM/SECONDARY TRANSFORMS section) Select [POST XFORM] to turn on post transform function. In this mode, the manipulated picture will always appear to the viewer from the same relative angle, as it is being moved horizontally or vertically. The viewpoint of the viewer moves with the transform.
[PREV]	(KEYFRAME section) Pressing [PREV] moves you immediately to the previous key frame in the effect sequence. The [PREV] pushbutton will be lighted to show that this function is active. If you are on the first key frame, [PREV] will be inactive.
[RECALL]	(E-MEM® section) There are three RECALL pushbuttons; you can select one, two, or all three of them at the same time. To select all three at once, hold down the [RECALL CH 1] pushbutton for 1/2 second. • Select [RECALL CH 1] to recall the Channel 1 parameters only; • Select [RECALL CH 2] to recall the Channel 2 parameters only; • Select [RECALL GLOBAL] to recall the global control parameters only. Selecting one or more of the [RECALL] pushbuttons prepares the system for a recall operation on the selected paths, as follows:

- If [RECALL TO CUR EFF] is on, pressing a numbered register pushbutton causes the recalled effect to be placed into the key frame current effect space.
- If [RECALL TO CUR EFF] is off, pressing a numbered register pushbutton will cause the recalled effect to be performed immediately; it will not be placed into the current effect space.

[RECALL TO CUR EFF]

(E-MEM® section) This is an on-off pushbutton. When it is on, performing a recall operation will place the recalled effect in the key frame current effect space. When [RECALL TO CUR EFF] is off, performing a recall operation will cause the recalled effect to be performed immediately; it will not be placed into the current effect space.

To undo a [RECALL TO CUR EFF] operation, see the [LAST X] entry.

[RECURS MEM]

(STREAMLINE™ DIRECT section) Pressing this pushbutton will immediately bring up the Recursive Memory Menu in the STREAMLINE™ display. This menu contains selections for the following functions: Trails, Montages, the Subtraction effect, Clear Event (this clears the screen whenever a key frame it is stored in is run), and Clear (this clears recursive pictures from the screen without changing the mode of operation).

[REPLCE]

(KEYFRAME/EDIT section) If you are exactly on a key frame in a current effect on an active (delegated) path, pressing [REPLCE] replaces that key frame with the key frame that is in the working key frame buffer. The [REPLCE] pushbutton will be lighted to show that this function is active. It will be dark and inactive if you are between key frames in an effect.

[RESTOR WORKNG KF]

(KEYFRAME/EDIT section) You can use this function to undo the most recent [CLEAR WORKNG KF] or [DELETE] operation. You can also use it to delete or copy a key frame and move it another place in the current effect.

- To undo a [CLEAR WORKNG KF] operation, simply press [RESTOR WORKNG KF]. The cleared data will immediately be restored to the working key frame buffer.
- To undo a [DELETE] operation, press [RESTOR WORKNG KF] to restore the deleted data to the working key frame buffer. You can now use [INSERT AFTER], [INSERT BEFORE], or [REPLCE] to insert the working key frame into the current effect, either in the same place it was before or in a new location.

[REV]

(EFFECT section) The [REV] function reverses the direction of movement of the current effect. When [REV] is selected:

- Pressing [REWIND] will move you to the last key frame in the effect and stop there.
- Pressing [RUN] or moving the lever from one limit towards the other will cause the effect to run backwards.

NOTE: *When running in Rev using "Hold", motion paths may produce unexpected results because the "Hold" function will now hold from its starting point to its previous KF instead of Next KF.*

[REWIND]

(EFFECT section) In normal mode ([REV] off), pressing [REWIND] will move you back to the first key frame in the current effect and stop there. When [REV] is selected, pressing [REWIND] will move you to the last key frame in the effect and stop there.

[ROT 3D]

(TRANSFORM section) The rotation function is used to position a picture around its X, Y, and Z axes (the spin function is used for multiple rotations). Selecting [ROT 3D] delegates the joystick and the DIRECT ENTRY keypad to the rotation transform parameters, as follows.

- To adjust the picture's X axis rotation value, move the joystick left or right or select [X] in the DIRECT ENTRY section, key in a value, and press [ENTER].

The picture will appear to rotate (compress and expand) around its Y axis.

- To adjust the picture's Y axis rotation value, move the joystick backward or forward or select [Y] in the DIRECT ENTRY section, key in a value, and press [ENTER]. The picture will appear to rotate (compress and expand) around its X axis.
- To rotate the picture around its Z axis; turn the joystick or select [Z] in the DIRECT ENTRY section, key in a value, and press [ENTER].

[LOCATE 3D], [ROT 3D], [SPIN], [AXIS LOCATE], [POST], [SKEW], [SIZE], and [PERSP] are all mutually exclusive pushbuttons; one will always be on, but never more than one.

[RUN]

(EFFECT section) The [RUN] pushbutton is used to run or step through an effect, as follows:

- In normal mode ([STOP/NEXT] off, [REV] off), pressing [RUN] will cause the current effect to run from beginning to end.
- When [STOP/NEXT] is selected (lighted), pressing [RUN] will step through one key frame of the effect with each press.
- When [REV] is selected, pressing [RUN] will run the effect backwards, from the last key frame to the first.

[SELF KEY]

(KEYER section) This pushbutton is used to select input keying for a channel from its own video. It is the only input key-source selection for a single channel system:

- If [SELF KEY], [EXT KEY CH1], or [EXT KEY CH2] are off, the keyer will produce a key that uses the entire manipulated picture (the raster) for the key signal. The KEYER CLIP and GAIN controls have no effect on the raster key.
- If [SELF KEY] is selected, the keyer will produce a luminance or linear key, depending on whether the [LINEAR KEY] pushbutton is selected:

- If [LINEAR KEY] is on, the keyer will produce a linear key. Linear keys are a special kind of luminance key and are described in detail under the " [LINEAR KEY]" entry in this dictionary.
- If [LINEAR KEY] is off, the keyer will produce a luminance key. For a luminance key, the fill video is inserted over the background video wherever the key source luminance level is higher than a clip reference level set by the operator. Luminance keys are recommended instead of linear keys when the key source signal needs shaping to avoid a mock-banding effect on the edges of the key.

The CLIP and GAIN control knobs are used for both luminance and linear keys, but the values for each are stored separately. As noted before, the controls are delegated to luminance key whenever [SELF KEY] is on and [LINEAR KEY] is off. In luminance key mode, the controls operate as follows:

- The CLIP control knob sets the dc reference level which is compared to the key luminance source; a "hole" will be cut in the background wherever the key level is greater than the clip reference level. Adjust the CLIP control knob for the desired key hole shape. The clip range is from 0 to 110 IRE units. Turning the knob counterclockwise lowers the clip reference level. At its full counterclockwise setting, the key will be full-on.
- The GAIN control determines the transparency of the image. For a luminance key, the gain range is 0 to 130 in NTSC systems. As gain increases, transparency of the key will decrease.

[SIZE]

(TRANSFORM/SECONDARY TRANSFORMS section) Selecting [SIZE] delegates the joystick and the DIRECT ENTRY keypad to the size function, as follows:

- To make the picture larger or smaller horizontally, delegate the panel to one or both channels, then move the joystick knob left or right or select [X] in the DIRECT ENTRY section, key in a value, and press [ENTER] (there is no X parameter for the Global channel). Resizing the X value will change the aspect of the picture.

- To make the picture larger or smaller vertically, delegate the panel to one or both channels, then move the joystick knob forward or backward or select [Y] in the DIRECT ENTRY section, key in a value, and press [ENTER] (there is no Y parameter for the Global channel). Resizing the Y value will change the aspect of the picture.
- To make the entire picture larger or smaller in proportion (no change in aspect), turn the joystick knob or select [Z] in the DIRECT ENTRY section, key in a value, and press [ENTER]. When you adjust Z size, the picture will appear to move closer to or further from the front plane of the screen along the Z axis, just as when you adjust Z location; however, it is important to note that in this case only the size of the picture has changed and not its location. Always use the [LOCATE 3D] pushbutton to position the picture along the Z axis. Using the Size function instead of the Locate function could produce unexpected results when you manipulate pictures in 3D space, especially in regard to picture priority (which picture is in front of the other).

[SKEW]

(TRANSFORM/SECONDARY TRANSFORMS section) Selecting this pushbutton delegates the joystick and DIRECT ENTRY keypad to the skew function. Moving the joystick left/right adjusts the slant of the picture on its horizontal (X) axis; moving the joystick forward/backward adjusts the slant of the picture on its vertical (Y) axis. There is no Z parameter for skew.

Soft controls

(STREAMLINE™ section) "Soft" controls are those which change their functions depending on which programs are currently being run. That is, their functions are determined by software rather than being fixed and unchanging.

The STREAMLINE™ section of the control panel contains one soft control knob and six soft pushbuttons. Each pushbutton is marked with a triangle pointing up towards the STREAMLINE™ display; this indicates that the display is used to label the pushbuttons according to their current functions. For example, the leftmost pushbutton will be labelled {Width} under the STREAMLINE™ {Border} program and {Router} under the {Person} program.

[SOURCE]

(TRANSFORM section) Selecting [SOURCE] turns source mode on and off. In source mode, pictures are manipulated in relationship to their own X, Y, Z parameters instead of the video monitor parameters. For example, if you first rotate a picture 90° and then use [LOCATE 3D] to change its X value, it will move along its own X axis instead of moving left/right on the monitor.

[SPIN]

(TRANSFORM section) The spin function is used to spin a picture repeatedly around a point in 3D space (the rotate function is used to position a picture around its own X, Y, and/or Z axes). Normally spin is applied to one axis only to produce a smooth effect, but you can use all three axes if desired. Selecting [SPIN] delegates the joystick and the DIRECT ENTRY keypad to the rotation transform parameters, as follows.

- To spin the picture by adjusting its X axis spin value, move the joystick left or right or select [X] in the DIRECT ENTRY section, key in a value, and press [ENTER]. The picture will appear to spin around its Y axis.
- To spin the picture by adjusting its Y axis spin value, move the joystick forward or backward or select [Y] in the DIRECT ENTRY section, key in a value, and press [ENTER]. The picture will appear to spin around its X axis.
- Spin: To spin the picture around its own center (its Z axis), turn the joystick knob or select [Z] in the DIRECT ENTRY section, key in a value, and press [ENTER].

[LOCATE 3D], [ROT 3D], [SPIN], [AXIS LOCATE], [POST], [SKEW], [SIZE], and [PERSP] are all mutually exclusive pushbuttons; one will always be on, but never more than one.

[STOP NEXT]

(EFFECT section) Select this pushbutton if you want to run the current effect step by step (one key frame at a time) instead of all at once. When the [STOP NEXT] pushbutton is selected:

- Pressing [RUN] performs one key frame and stops at the next.
- Moving the lever from one limit to the other performs one key frame and stops at the next.

STREAMLINE™ knob

(STREAMLINE™ section) The STREAMLINE™ knob is a "soft" control which changes its function depending on which program is currently being run. That is, its function is determined by software rather than being fixed and unchanging.

The STREAMLINE™ section of the control panel contains a display located to the left of the control knob. The upper right-hand corner of the display is used to label the knob according to its current function. For example, if you select {Key Layer}, {Bkgnd}, and {Hue} from the STREAMLINE™ menus, the knob will be labelled "Hue;" if you select {Border}, {Width}, and {Top}, the knob will be labelled "Top."

[TRIM]

(DIRECT ENTRY section) Trimming is a way of adding a precise value to the current X, Y, or Z values. For example, if X = 1.3 for a location transformation and you trim the X value by -1.9, the new X value will be -0.6. To use trim, first select one of the TRANSFORM pushbuttons. Then select [X], [Y], or [Z], key in the value you want to add, and press [TRIM] .

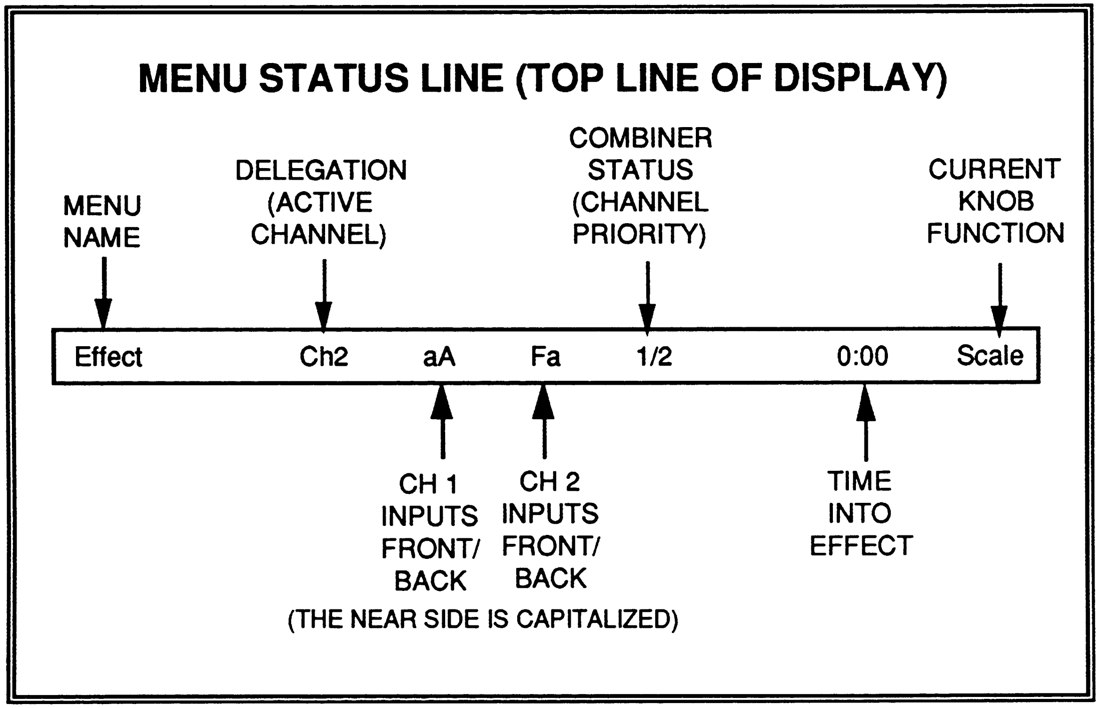
[X]	(DIRECT ENTRY section) Pressing [X] delegates the DIRECT ENTRY keypad to the X value for the currently selected TRANSFORM function. That is, if you select [X], key in a value, and then press [ENTER], the value you entered becomes the current X value for the transform. If you press [TRIM] instead of [ENTER], the value you keyed in would be added to the current X value.
[Y]	(DIRECT ENTRY section) Pressing [Y] delegates the DIRECT ENTRY keypad to the Y value for the currently selected TRANSFORM function. That is, if you select [Y], key in a value, and then press [ENTER], the value you entered becomes the current Y value for the transform. If you press [TRIM] instead of [ENTER], the value you keyed in would be added to the current Y value.
[Z]	(DIRECT ENTRY section) Pressing [Z] delegates the DIRECT ENTRY keypad to the Z value for the currently selected TRANSFORM function. That is, if you select [Z], key in a value, and then press [ENTER], the value you entered becomes the current Z value for the transform. If you press [TRIM] instead of [ENTER], the value you keyed in would be added to the current Z value.

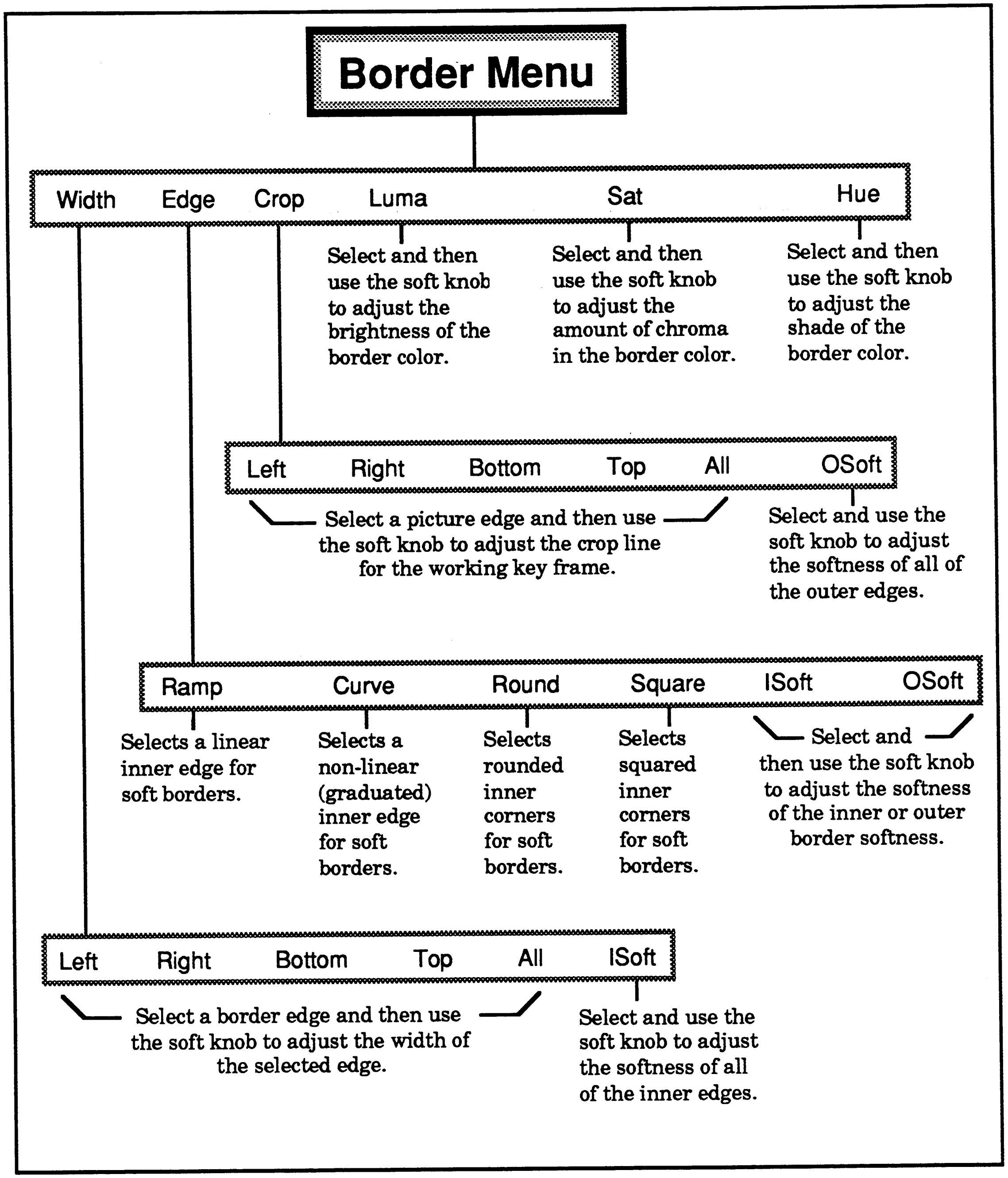
STREAMLINE™ MENU TREES

The following pages contain menu trees for each of the STREAMLINE™ programs. Each menu tree shows all of the different menu levels, with brief descriptions of each menu pushbutton selection (pushbuttons are labelled in the bottom line of the display).

The display also has a status line (the top line) which contains information about the current status of the DPM-700, as shown below.

For detailed, step-by-step information about operations, refer to the Basic Effects and Advanced Effects sections of this manual.


MENU STATUS LINE (TOP LINE OF DISPLAY)
MENU NAME
DELEGATION (ACTIVE CHANNEL)
COMBINER STATUS (CHANNEL PRIORITY)
CURRENT KNOB FUNCTION
Effect
Ch2
aA
Fa
1/2
0:00
Scale
CH 1 INPUTS FRONT/ BACK
CH 2 INPUTS FRONT/ BACK
(THE NEAR SIDE IS CAPITALIZED)
TIME INTO EFFECT


Border Menu
Width
Edge
Crop
Luma
Sat
Hue
Left
Right
Bottom
Top
All
OSoft
Ramp
Curve
Round
Square
ISoft
OSoft
Left
Right
Bottom
Top
All
ISoft

Luma: Select and then use the soft knob to adjust the brightness of the border color.

Sat: Select and then use the soft knob to adjust the amount of chroma in the border color.

Hue: Select and then use the soft knob to adjust the shade of the border color.

Crop (Left, Right, Bottom, Top, All): Select a picture edge and then use the soft knob to adjust the crop line for the working key frame.

OSoft: Select and use the soft knob to adjust the softness of all of the outer edges.

Ramp: Selects a linear inner edge for soft borders.

Curve: Selects a non-linear (graduated) inner edge for soft borders.

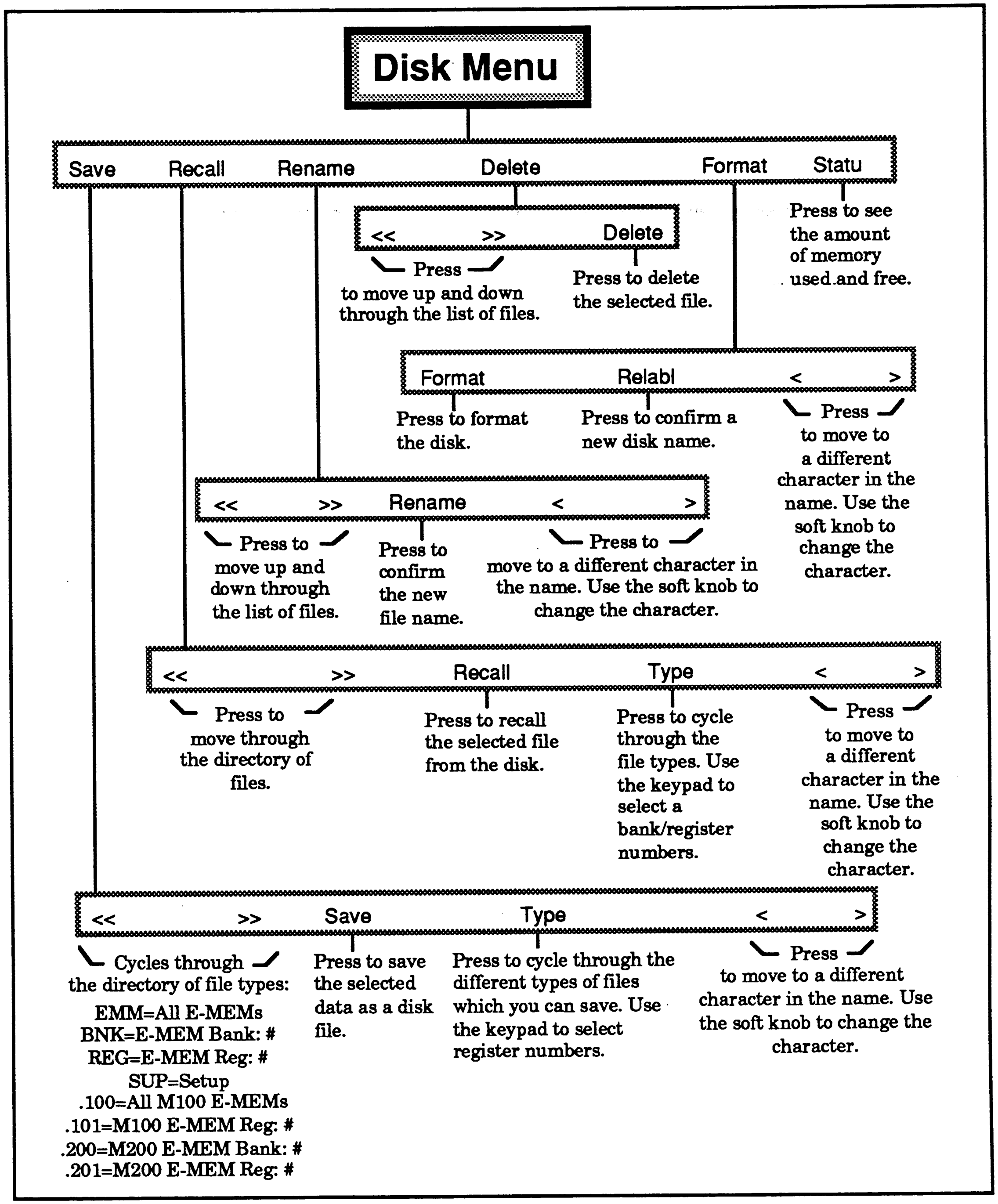
Round: Selects rounded inner corners for soft borders.

Square: Selects squared inner corners for soft borders.

ISoft, OSoft: Select and then use the soft knob to adjust the softness of the inner or outer border softness.

Width (Left, Right, Bottom, Top, All): Select a border edge and then use the soft knob to adjust the width of the selected edge.

ISoft: Select and use the soft knob to adjust the softness of all of the inner edges.



Press to see the amount of memory used and free.

Press to move up and down through the list of files.

Press to delete the selected file.

Press to format the disk.

Press to confirm a new disk name.

Press to move to a different character in the name. Use the soft knob to change the character.

Press to move up and down through the list of files.

Press to confirm the new file name.

Press to move to a different character in the name. Use the soft knob to change the character.

Press to move through the directory of files.

Press to recall the selected file from the disk.

Press to cycle through the file types. Use the keypad to select a bank/register numbers.

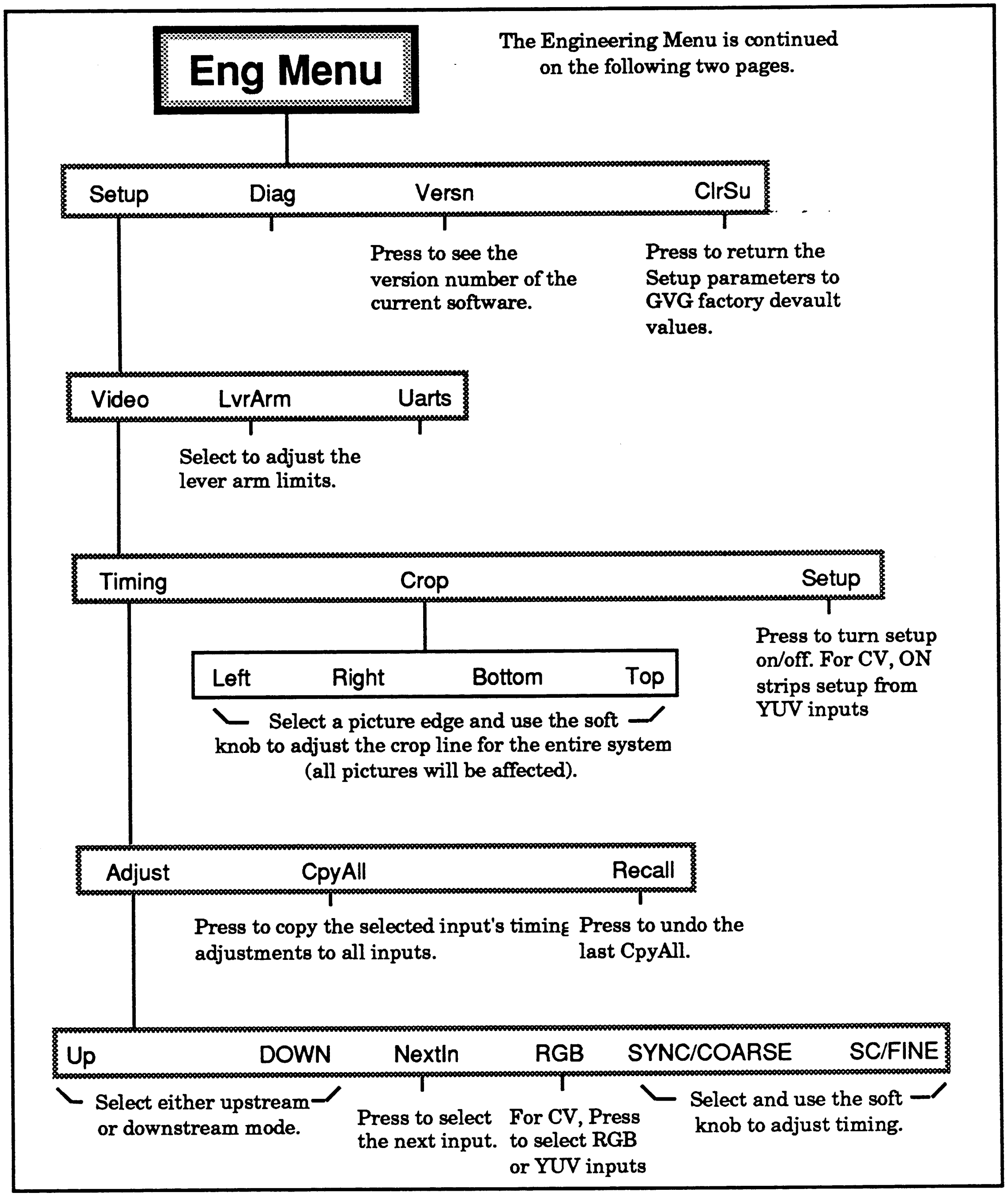
Press to move to a different character in the name. Use the soft knob to change the character.

Cycles through the directory of file types:
EMM=All E-MEMs
BNK=E-MEM Bank: #
REG=E-MEM Reg: #
SUP=Setup
.100=All M100 E-MEMs
.101=M100 E-MEM Reg: #
.200=M200 E-MEM Bank: #
.201=M200 E-MEM Reg: #

Press to save the selected data as a disk file.

Press to cycle through the different types of files which you can save. Use the keypad to select register numbers.

Press to move to a different character in the name. Use the soft knob to change the character.


Eng Menu
Setup
Diag
Versn
ClrSu
Video
LvrArm
Uarts
Timing
Crop
Setup
Left
Right
Bottom
Top
Adjust
CpyAll
Recall
Up
DOWN
NextIn
RGB
SYNC/COARSE
SC/FINE

The Engineering Menu is continued on the following two pages.

Versn: Press to see the version number of the current software.

ClrSu: Press to return the Setup parameters to GVG factory devault values.

LvrArm: Select to adjust the lever arm limits.

Left, Right, Bottom, Top: Select a picture edge and use the soft knob to adjust the crop line for the entire system (all pictures will be affected).

Setup: Press to turn setup on/off. For CV, ON strips setup from YUV inputs

CpyAll: Press to copy the selected input's timing adjustments to all inputs.

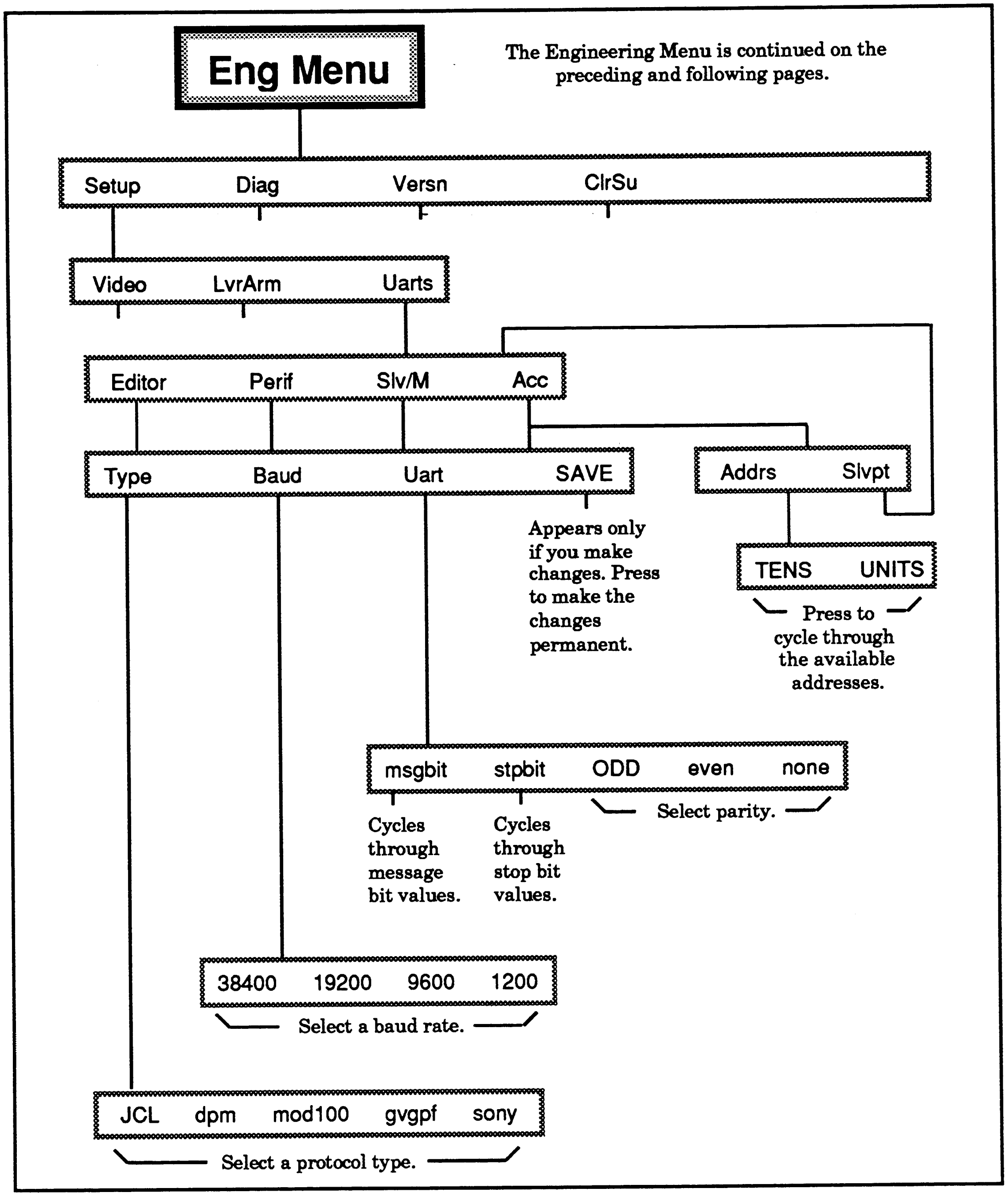
Recall: Press to undo the last CpyAll.

Up, DOWN: Select either upstream or downstream mode.

NextIn: Press to select the next input.

RGB: For CV, Press to select RGB or YUV inputs

SYNC/COARSE, SC/FINE: Select and use the soft knob to adjust timing.


Eng Menu
Setup
Diag
Versn
ClrSu
Video
LvrArm
Uarts
Editor
Perif
Slv/M
Acc
Type
Baud
Uart
SAVE
Addrs
Slvpt
TENS
UNITS
msgbit
stpbit
ODD
even
none
38400
19200
9600
1200
JCL
dpm
mod100
gvgpf
sony

The Engineering Menu is continued on the preceding and following pages.

Appears only if you make changes. Press to make the changes permanent.

Press to cycle through the available addresses.

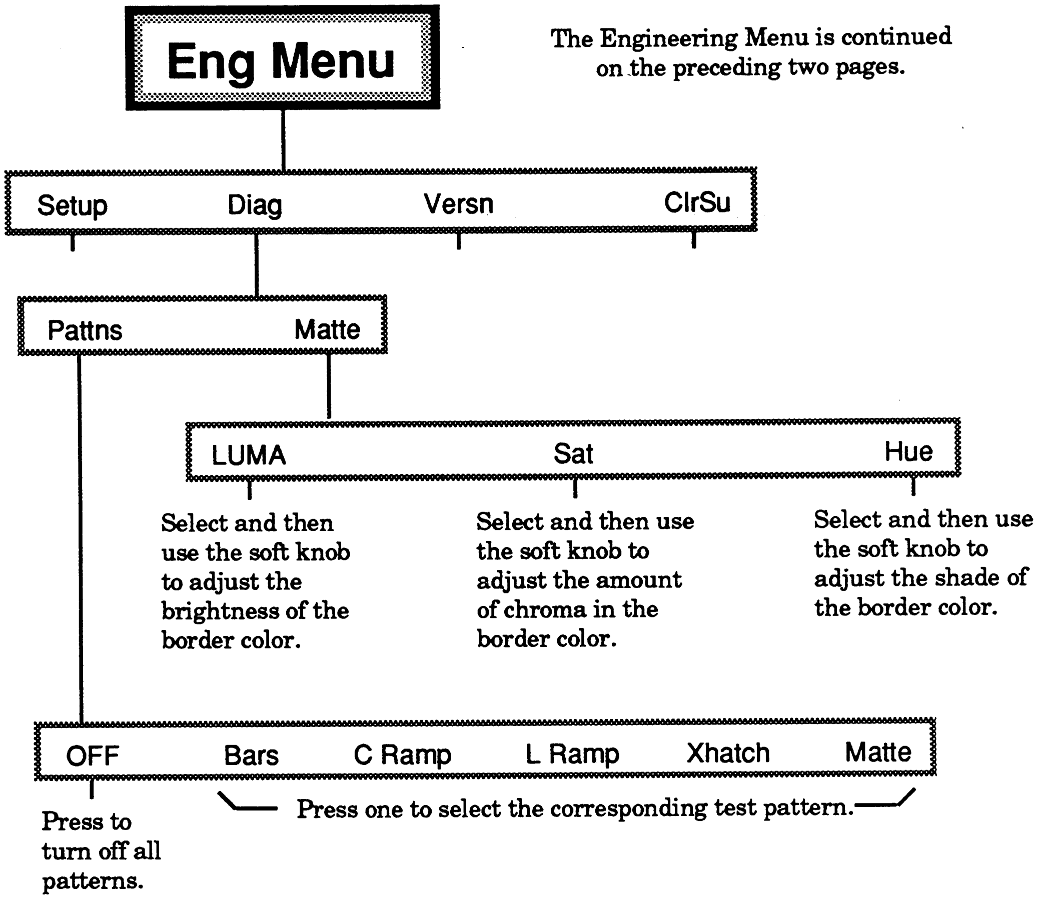
Cycles through message bit values.

Cycles through stop bit values.

Select parity.

Select a baud rate.

Select a protocol type.


Eng Menu
Setup
Diag
Versn
ClrSu
Pattns
Matte
LUMA
Sat
Hue
OFF
Bars
C Ramp
L Ramp
Xhatch
Matte

The Engineering Menu is continued on the preceding two pages.

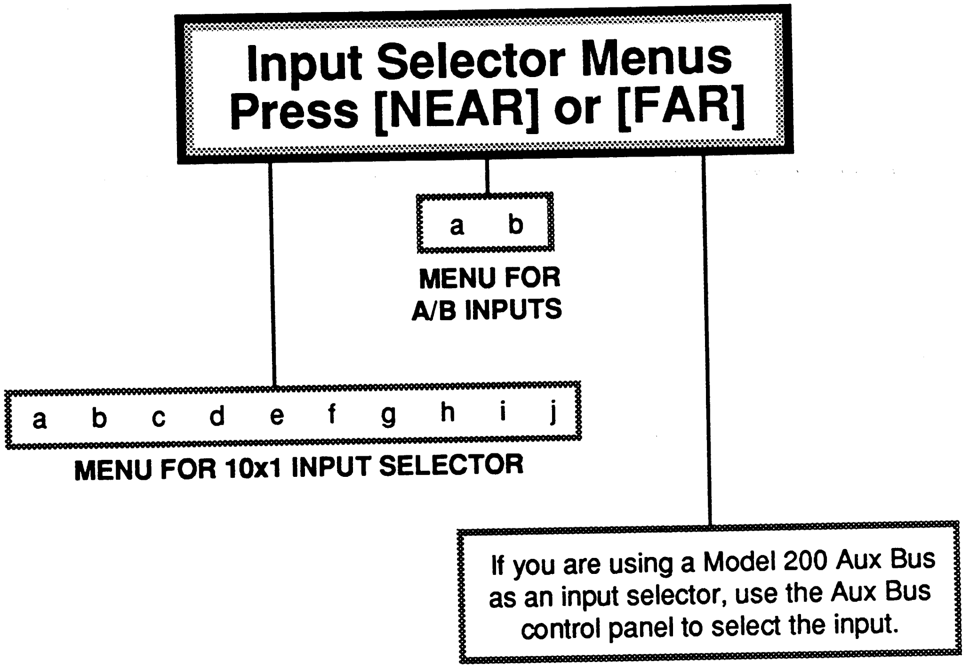
LUMA: Select and then use the soft knob to adjust the brightness of the border color.

Sat: Select and then use the soft knob to adjust the amount of chroma in the border color.

Hue: Select and then use the soft knob to adjust the shade of the border color.

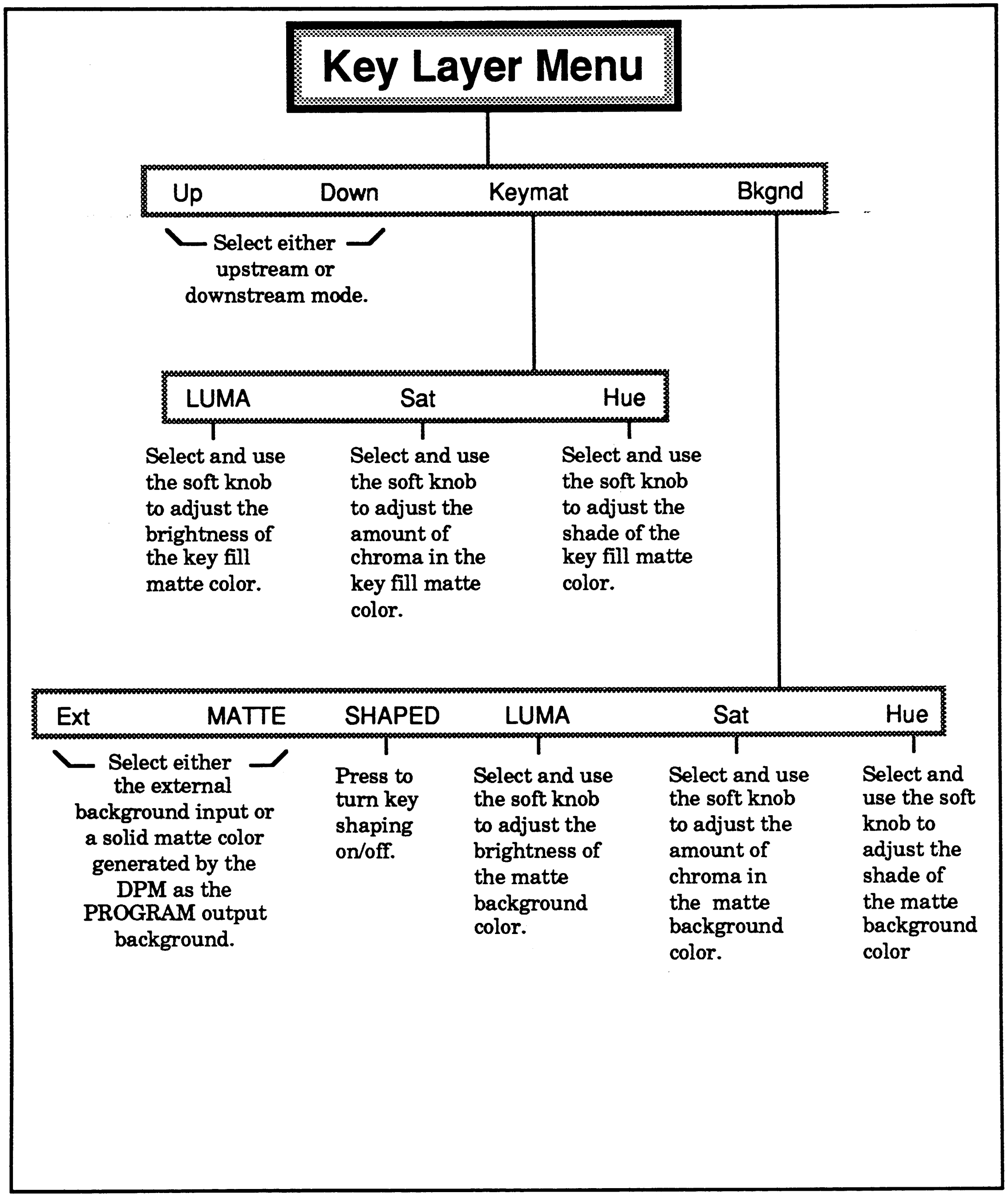
OFF: Press to turn off all patterns.

Bars, C Ramp, L Ramp, Xhatch, Matte: Press one to select the corresponding test pattern.


Input Selector Menus
Press [NEAR] or [FAR]
a b
MENU FOR
A/B INPUTS
a b c d e f g h i j
MENU FOR 10x1 INPUT SELECTOR

If you are using a Model 200 Aux Bus as an input selector, use the Aux Bus control panel to select the input.

Use the {Person} and {Router} menus to select either the standard A/B inputs, the optional 10x1 Input Selector, or an optional Model 200 Aux Bus to supply the inputs to your DPM-700.



Up / Down: Select either upstream or downstream mode.

LUMA: Select and use the soft knob to adjust the brightness of the key fill matte color.

Sat: Select and use the soft knob to adjust the amount of chroma in the key fill matte color.

Hue: Select and use the soft knob to adjust the shade of the key fill matte color.

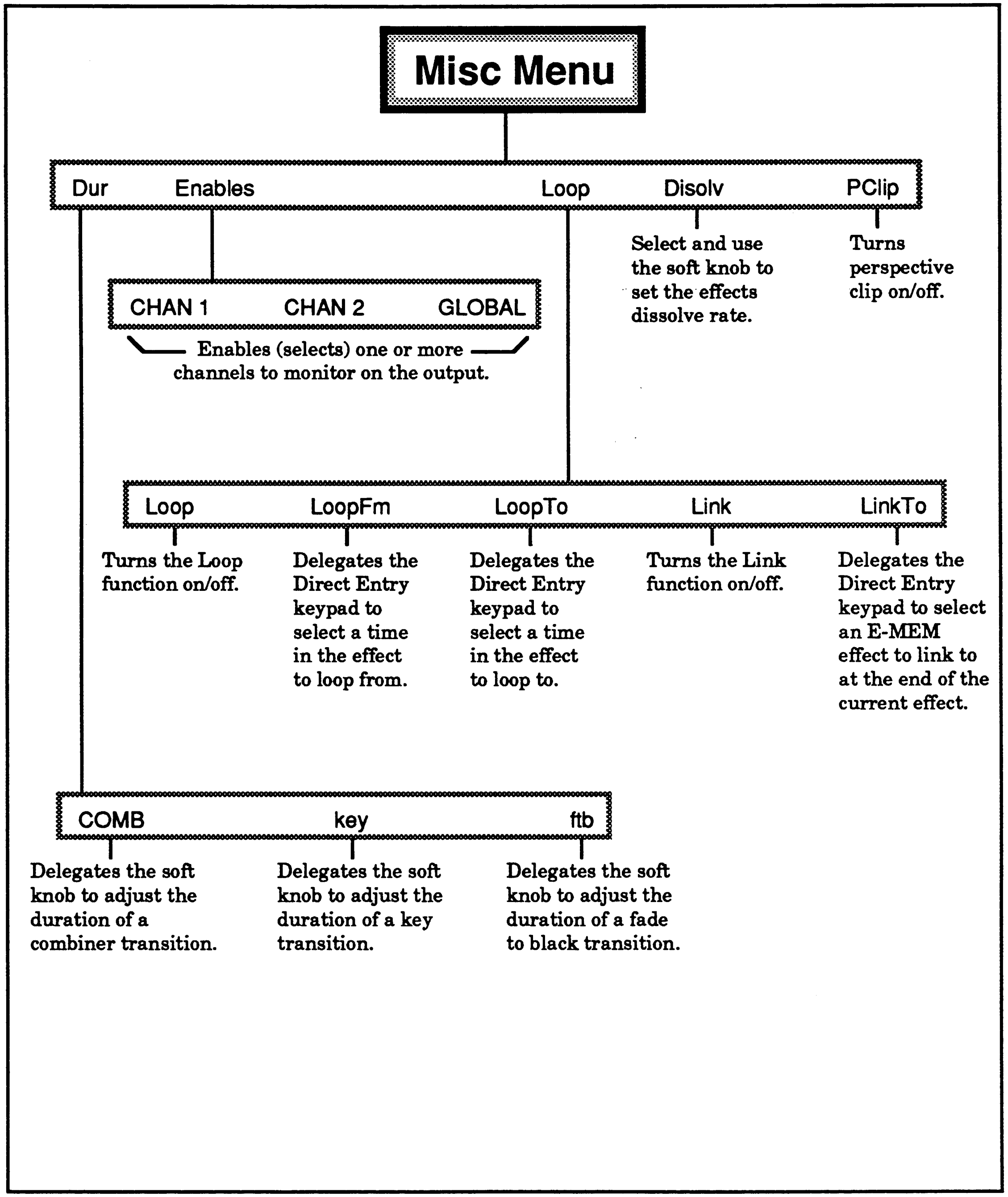
Ext / MATTE: Select either the external background input or a solid matte color generated by the DPM as the PROGRAM output background.

SHAPED: Press to turn key shaping on/off.

LUMA: Select and use the soft knob to adjust the brightness of the matte background color.

Sat: Select and use the soft knob to adjust the amount of chroma in the matte background color.

Hue: Select and use the soft knob to adjust the shade of the matte background color


Misc Menu
Dur
Enables
Loop
Disolv
PClip
CHAN 1
CHAN 2
GLOBAL
Loop
LoopFm
LoopTo
Link
LinkTo
COMB
key
ftb

Disolv: Select and use the soft knob to set the effects dissolve rate.

PClip: Turns perspective clip on/off.

CHAN 1, CHAN 2, GLOBAL: Enables (selects) one or more channels to monitor on the output.

Loop: Turns the Loop function on/off.

LoopFm: Delegates the Direct Entry keypad to select a time in the effect to loop from.

LoopTo: Delegates the Direct Entry keypad to select a time in the effect to loop to.

Link: Turns the Link function on/off.

LinkTo: Delegates the Direct Entry keypad to select an E-MEM effect to link to at the end of the current effect.

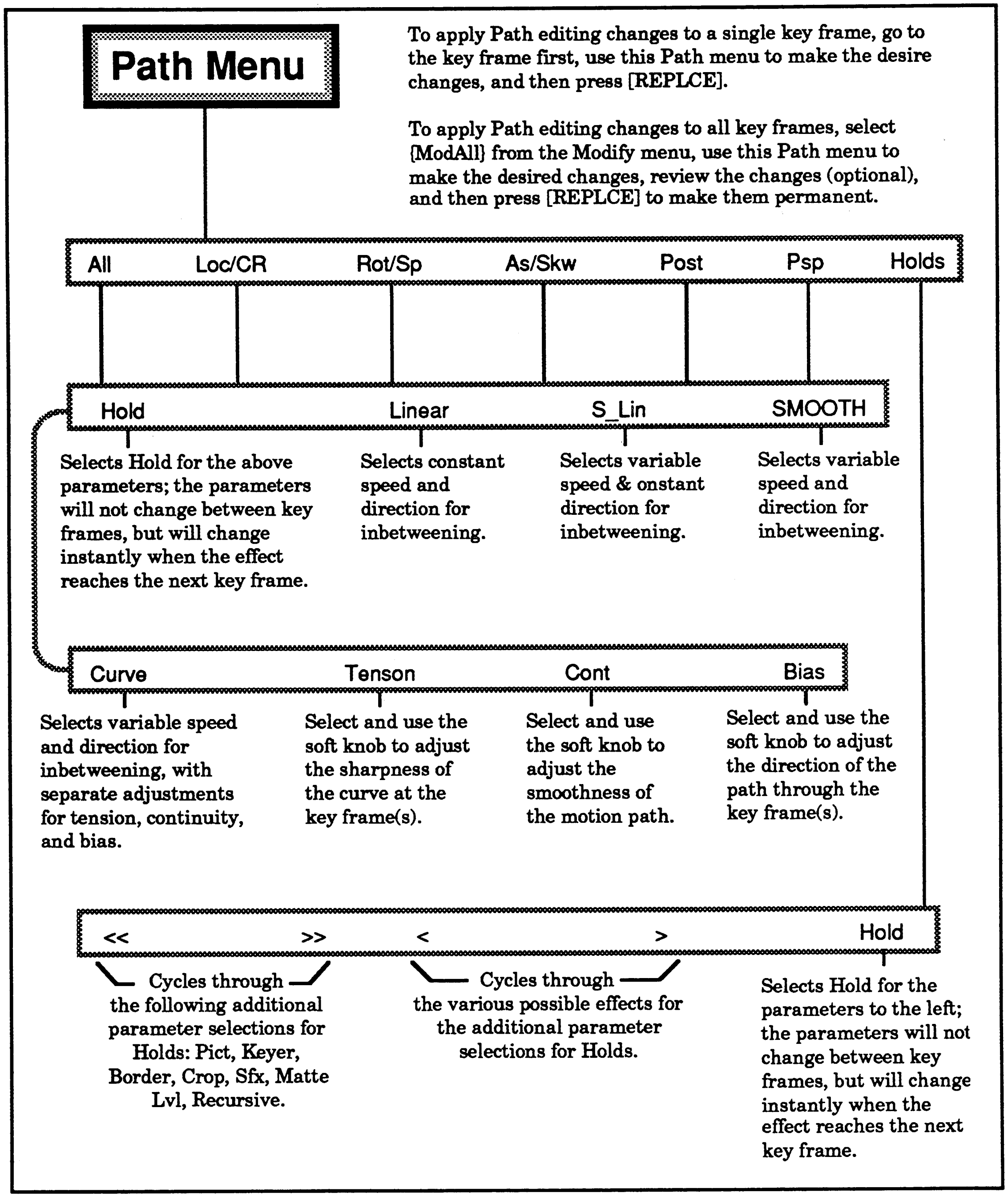
COMB: Delegates the soft knob to adjust the duration of a combiner transition.

key: Delegates the soft knob to adjust the duration of a key transition.

ftb: Delegates the soft knob to adjust the duration of a fade to black transition.

Modify Menu

ModAll	Cp1to2	Cp2to1	Kf1to2	Kf2to1	Save
Select and use the control panel to change all key frames.	Copies Ch 1's current effect to Channel 2 as long as Ch 2's current effect is empty.	Copies Ch 2's current effect to Channel 1 as long as Ch 1's current effect is empty.	Copies the Ch 1 working key frame to Channel 2.	Copies the Ch 2 working key frame to Channel 1.	Press to save the working key frame in a buffer; press [RESTOR WORKNG KF] to restore it.



To apply Path editing changes to a single key frame, go to the key frame first, use this Path menu to make the desire changes, and then press [REPLCE].

To apply Path editing changes to all key frames, select {ModAll} from the Modify menu, use this Path menu to make the desired changes, review the changes (optional), and then press [REPLCE] to make them permanent.

Hold

Selects Hold for the above parameters; the parameters will not change between key frames, but will change instantly when the effect reaches the next key frame.

Linear

Selects constant speed and direction for inbetweening.

S_Lin

Selects variable speed & onstant direction for inbetweening.

SMOOTH

Selects variable speed and direction for inbetweening.

Curve

Selects variable speed and direction for inbetweening, with separate adjustments for tension, continuity, and bias.

Tenson

Select and use the soft knob to adjust the sharpness of the curve at the key frame(s).

Cont

Select and use the soft knob to adjust the smoothness of the motion path.

Bias

Select and use the soft knob to adjust the direction of the path through the key frame(s).

<< **>>**

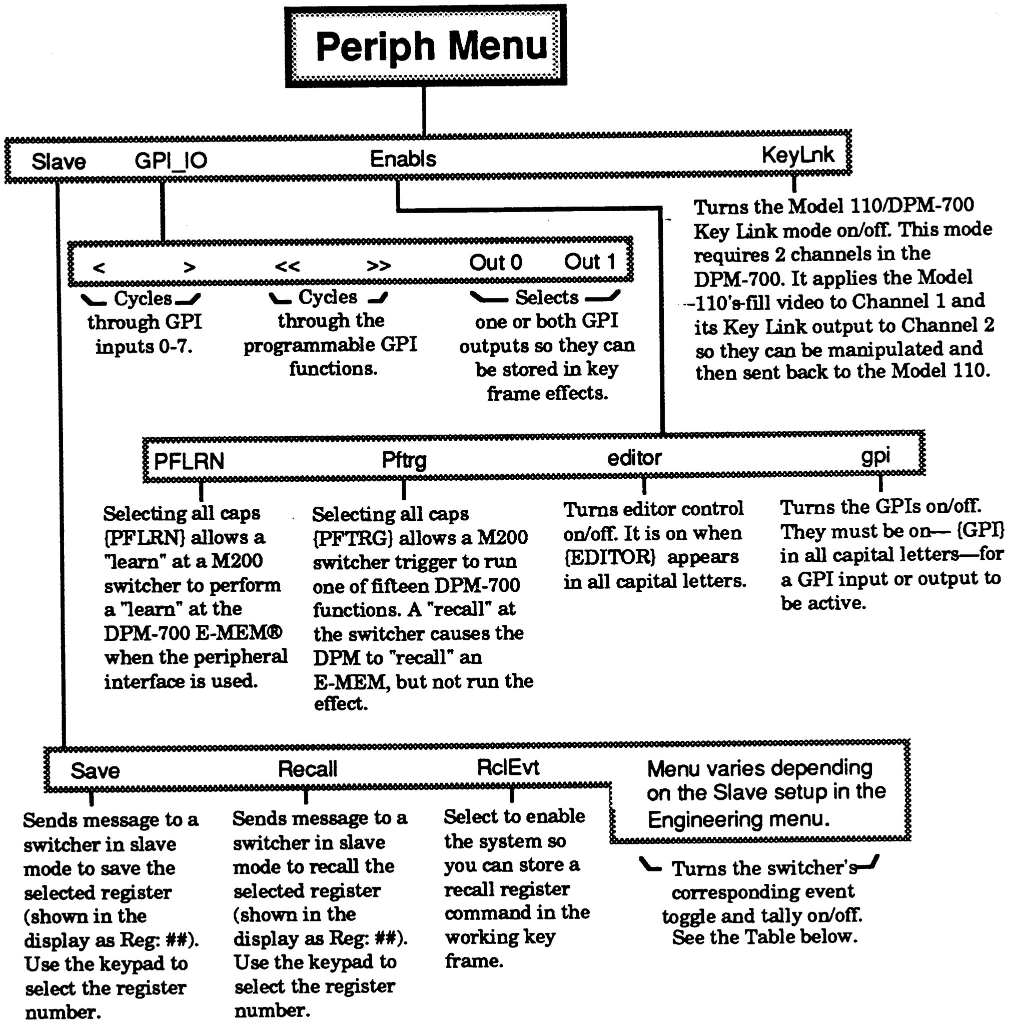
Cycles through the following additional parameter selections for Holds: Pict, Keyer, Border, Crop, Sfx, Matte Lvl, Recursive.

< **>**

Cycles through the various possible effects for the additional parameter selections for Holds.

Hold

Selects Hold for the parameters to the left; the parameters will not change between key frames, but will change instantly when the effect reaches the next key frame.



KeyLnk: Turns the Model 110/DPM-700 Key Link mode on/off. This mode requires 2 channels in the DPM-700. It applies the Model 110's fill video to Channel 1 and its Key Link output to Channel 2 so they can be manipulated and then sent back to the Model 110.

< >: Cycles through GPI inputs 0-7.

<< >>: Cycles through the programmable GPI functions.

Out 0 Out 1: Selects one or both GPI outputs so they can be stored in key frame effects.

PFLRN: Selecting all caps {PFLRN} allows a "learn" at a M200 switcher to perform a "learn" at the DPM-700 E-MEM® when the peripheral interface is used.

Pftrg: Selecting all caps {PFTRG} allows a M200 switcher trigger to run one of fifteen DPM-700 functions. A "recall" at the switcher causes the DPM to "recall" an E-MEM, but not run the effect.

editor: Turns editor control on/off. It is on when {EDITOR} appears in all capital letters.

gpi: Turns the GPIs on/off. They must be on— {GPI} in all capital letters—for a GPI input or output to be active.

Save: Sends message to a switcher in slave mode to save the selected register (shown in the display as Reg: ##). Use the keypad to select the register number.

Recall: Sends message to a switcher in slave mode to recall the selected register (shown in the display as Reg: ##). Use the keypad to select the register number.

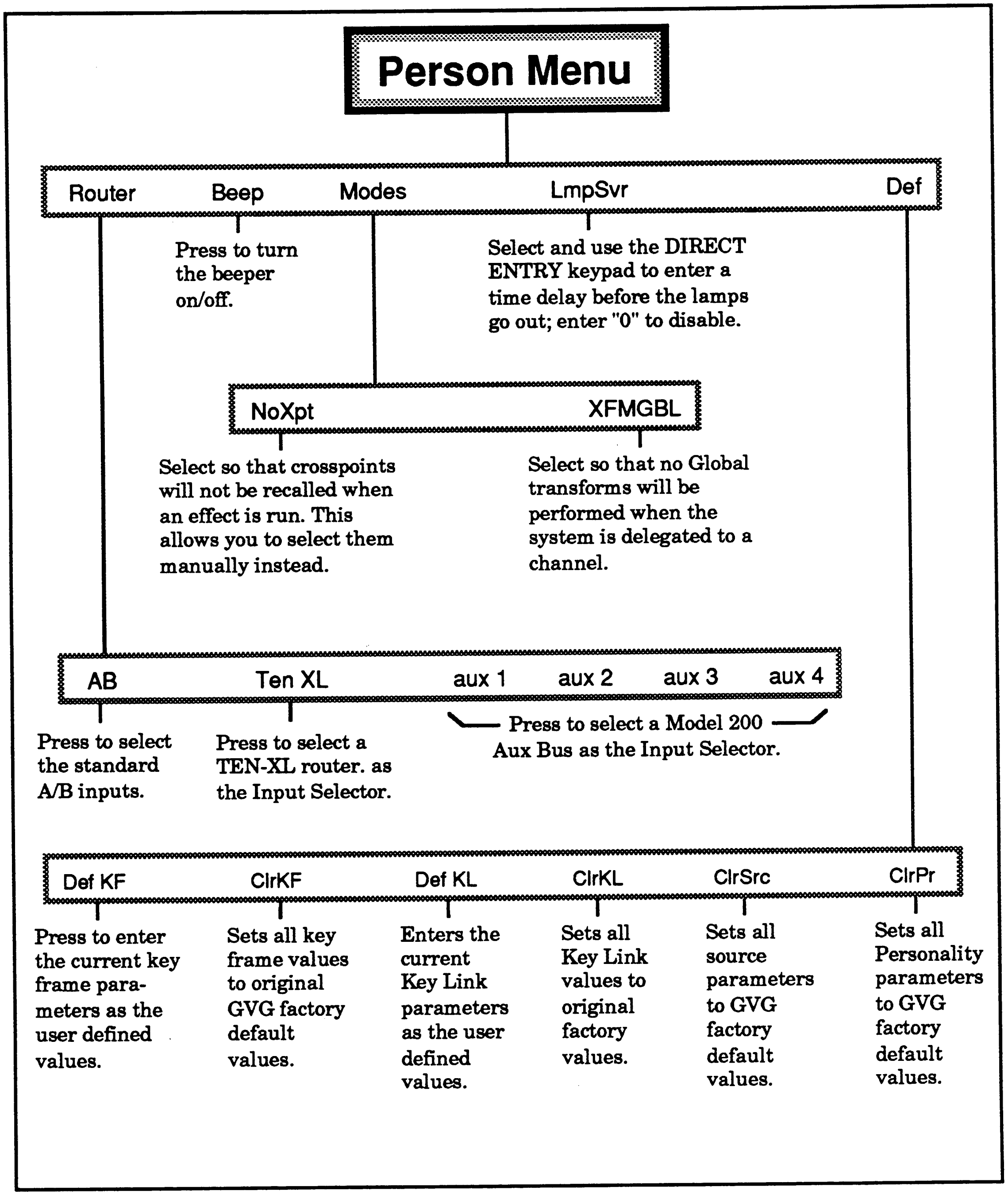
RclEvt: Select to enable the system so you can store a recall register command in the working key frame.

Menu varies depending on the Slave setup in the Engineering menu.

Turns the switcher's corresponding event toggle and tally on/off. See the Table below.

Table of Switcher Events

MODEL 100/110:	prgcut	prg_at	dskcut	dsk_at	ftb		
MODEL 200-1:	prgcut	prg_at	me1cut	me1_at	dskcut	dsk_at	ftb
MODEL 200-2:	dskcut	dsk_at	me1cut	me1_at	me2cut	me2_at	ftb


Person Menu
Router
Beep
Modes
LmpSvr
Def
NoXpt
XFMGBL
AB
Ten XL
aux 1
aux 2
aux 3
aux 4
Def KF
ClrKF
Def KL
ClrKL
ClrSrc
ClrPr

Beep: Press to turn the beeper on/off.

LmpSvr: Select and use the DIRECT ENTRY keypad to enter a time delay before the lamps go out; enter "0" to disable.

NoXpt: Select so that crosspoints will not be recalled when an effect is run. This allows you to select them manually instead.

XFMGBL: Select so that no Global transforms will be performed when the system is delegated to a channel.

AB: Press to select the standard A/B inputs.

Ten XL: Press to select a TEN-XL router. as the Input Selector.

aux 1 – aux 4: Press to select a Model 200 Aux Bus as the Input Selector.

Def KF: Press to enter the current key frame parameters as the user defined values.

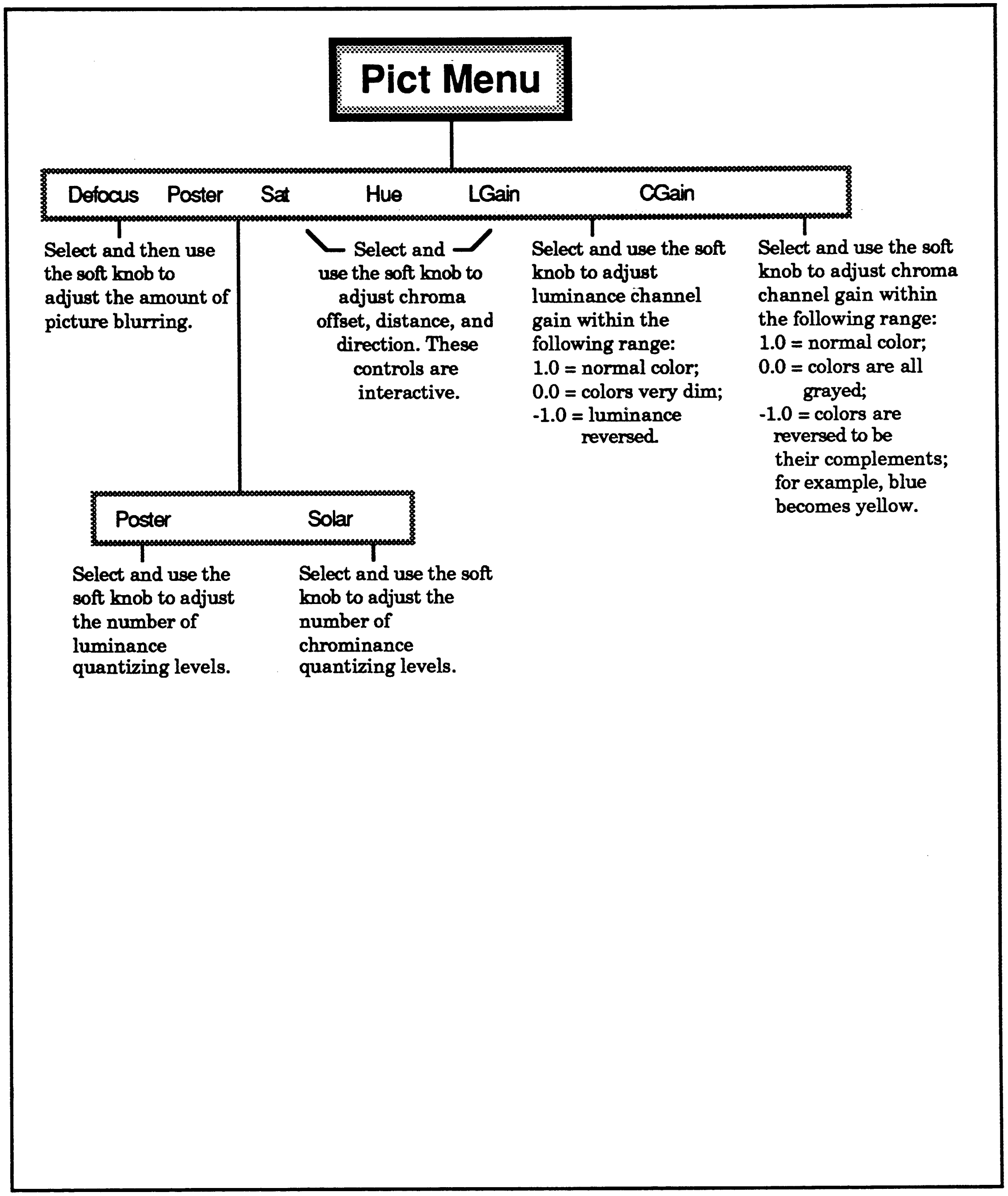
ClrKF: Sets all key frame values to original GVG factory default values.

Def KL: Enters the current Key Link parameters as the user defined values.

ClrKL: Sets all Key Link values to original factory values.

ClrSrc: Sets all source parameters to GVG factory default values.

ClrPr: Sets all Personality parameters to GVG factory default values.



Select and then use the soft knob to adjust the amount of picture blurring.

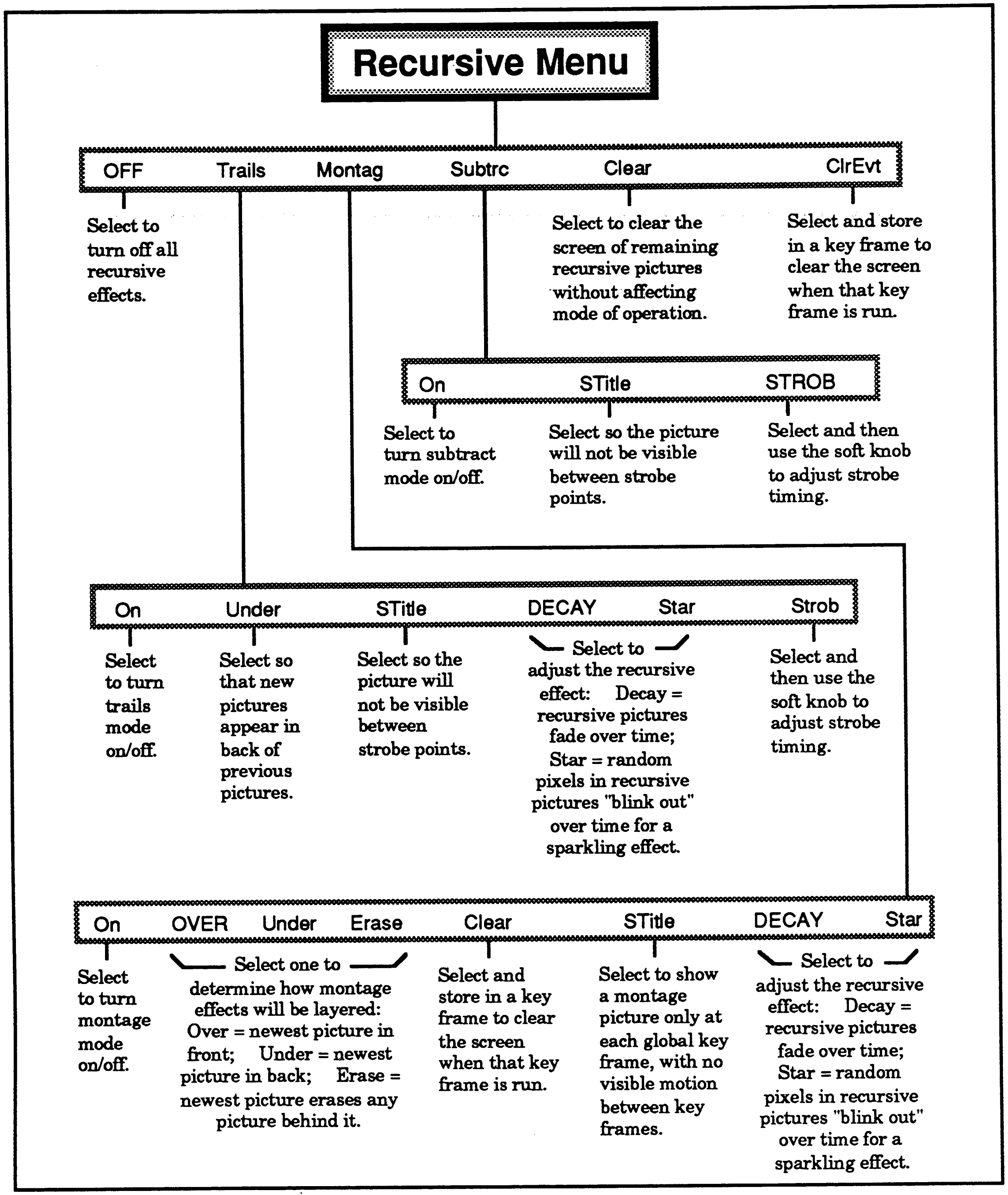
Select and use the soft knob to adjust chroma offset, distance, and direction. These controls are interactive.

Select and use the soft knob to adjust luminance channel gain within the following range:
1.0 = normal color;
0.0 = colors very dim;
-1.0 = luminance reversed.

Select and use the soft knob to adjust chroma channel gain within the following range:
1.0 = normal color;
0.0 = colors are all grayed;
-1.0 = colors are reversed to be their complements; for example, blue becomes yellow.

Select and use the soft knob to adjust the number of luminance quantizing levels.

Select and use the soft knob to adjust the number of chrominance quantizing levels.



OFF: Select to turn off all recursive effects.

Clear: Select to clear the screen of remaining recursive pictures without affecting mode of operation.

ClrEvt: Select and store in a key frame to clear the screen when that key frame is run.

Subtrc — On: Select to turn subtract mode on/off.

Subtrc — STitle: Select so the picture will not be visible between strobe points.

Subtrc — STROB: Select and then use the soft knob to adjust strobe timing.

Trails — On: Select to turn trails mode on/off.

Trails — Under: Select so that new pictures appear in back of previous pictures.

Trails — STitle: Select so the picture will not be visible between strobe points.

Trails — DECAY, Star: Select to adjust the recursive effect: Decay = recursive pictures fade over time; Star = random pixels in recursive pictures "blink out" over time for a sparkling effect.

Trails — Strob: Select and then use the soft knob to adjust strobe timing.

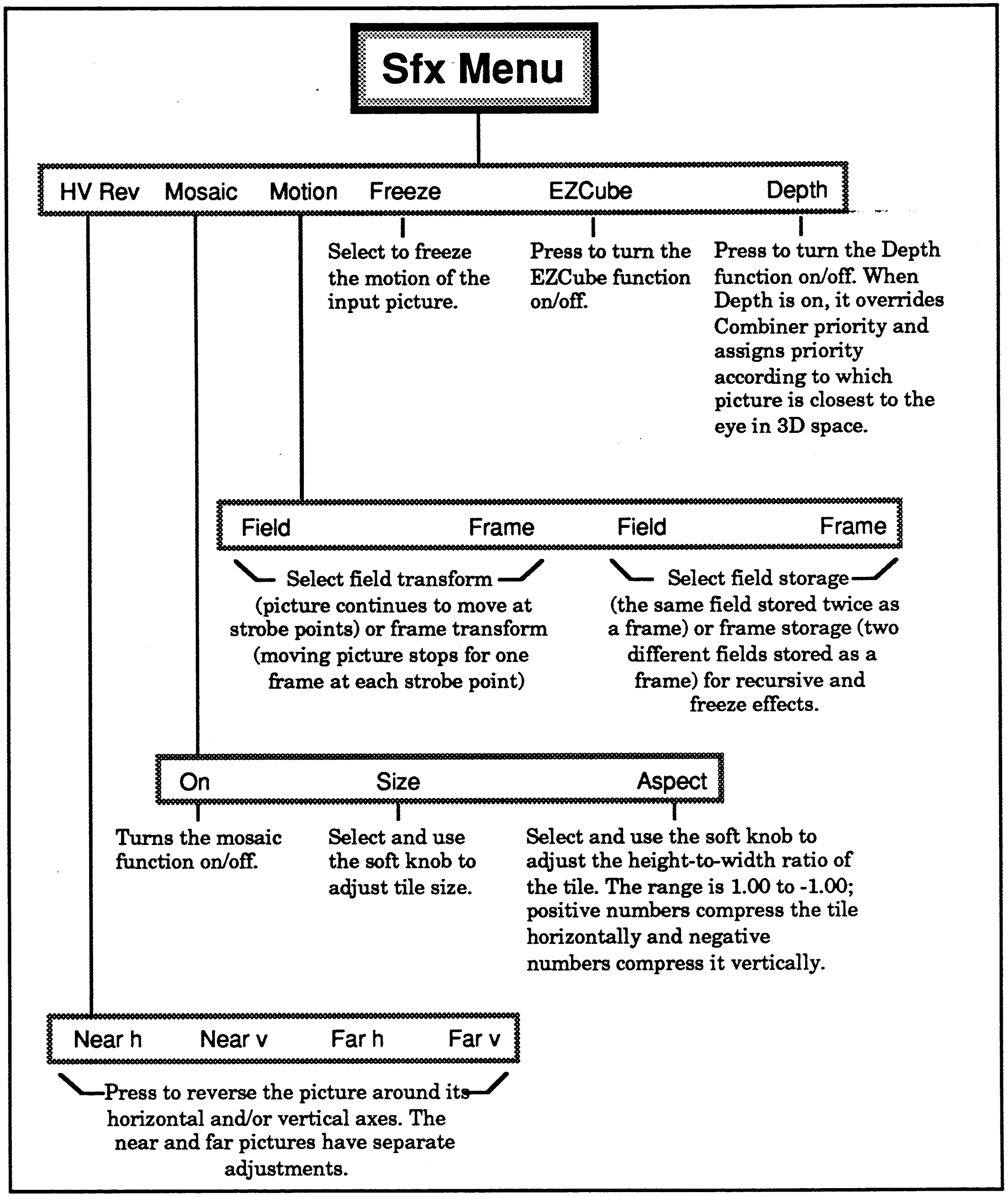
Montag — On: Select to turn montage mode on/off.

Montag — OVER, Under, Erase: Select one to determine how montage effects will be layered: Over = newest picture in front; Under = newest picture in back; Erase = newest picture erases any picture behind it.

Montag — Clear: Select and store in a key frame to clear the screen when that key frame is run.

Montag — STitle: Select to show a montage picture only at each global key frame, with no visible motion between key frames.

Montag — DECAY, Star: Select to adjust the recursive effect: Decay = recursive pictures fade over time; Star = random pixels in recursive pictures "blink out" over time for a sparkling effect.



Freeze: Select to freeze the motion of the input picture.

EZCube: Press to turn the EZCube function on/off.

Depth: Press to turn the Depth function on/off. When Depth is on, it overrides Combiner priority and assigns priority according to which picture is closest to the eye in 3D space.

Field / Frame: Select field transform (picture continues to move at strobe points) or frame transform (moving picture stops for one frame at each strobe point)

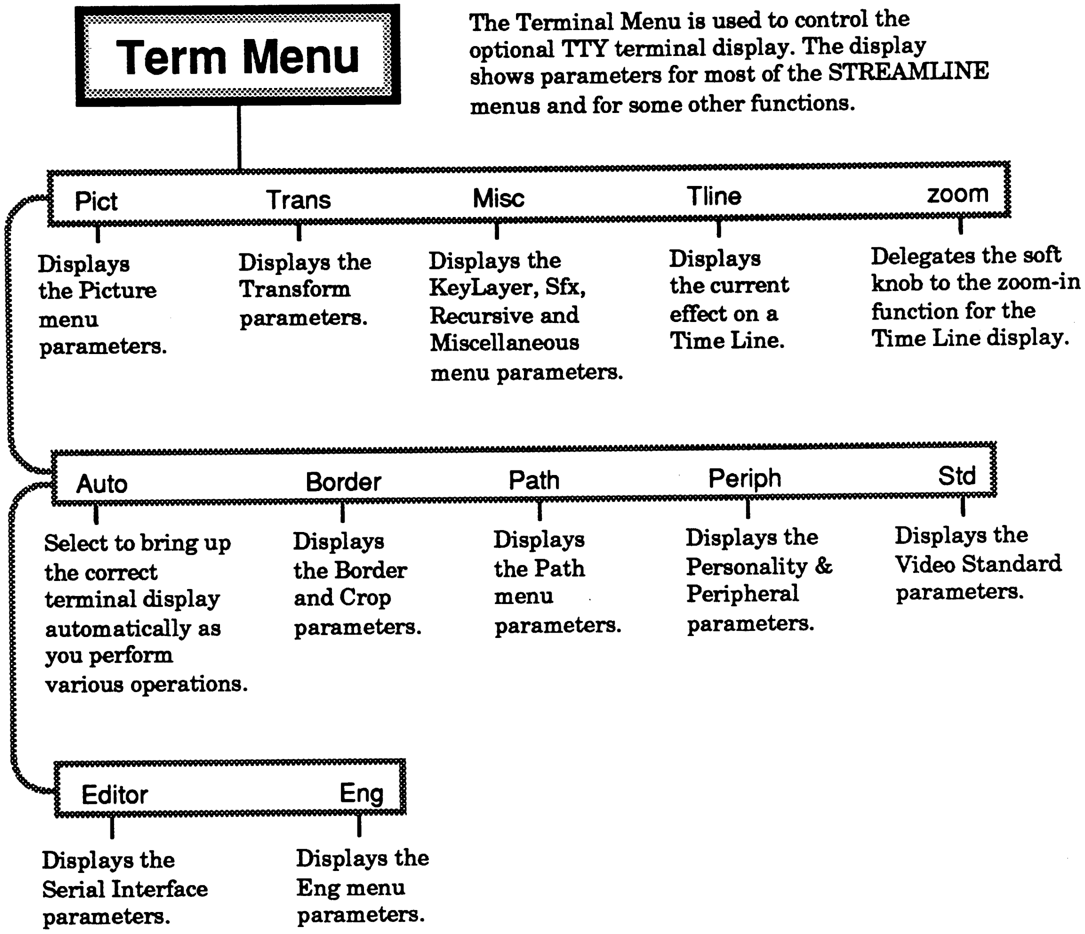
Field / Frame: Select field storage (the same field stored twice as a frame) or frame storage (two different fields stored as a frame) for recursive and freeze effects.

On: Turns the mosaic function on/off.

Size: Select and use the soft knob to adjust tile size.

Aspect: Select and use the soft knob to adjust the height-to-width ratio of the tile. The range is 1.00 to -1.00; positive numbers compress the tile horizontally and negative numbers compress it vertically.

Near h / Near v / Far h / Far v: Press to reverse the picture around its horizontal and/or vertical axes. The near and far pictures have separate adjustments.



Term Menu

The Terminal Menu is used to control the optional TTY terminal display. The display shows parameters for most of the STREAMLINE menus and for some other functions.

Pict	Trans	Misc	Tline	zoom
Displays the Picture menu parameters.	Displays the Transform parameters.	Displays the KeyLayer, Sfx, Recursive and Miscellaneous menu parameters.	Displays the current effect on a Time Line.	Delegates the soft knob to the zoom-in function for the Time Line display.

Auto	Border	Path	Periph	Std
Select to bring up the correct terminal display automatically as you perform various operations.	Displays the Border and Crop parameters.	Displays the Path menu parameters.	Displays the Personality & Peripheral parameters.	Displays the Video Standard parameters.

Editor	Eng
Displays the Serial Interface parameters.	Displays the Eng menu parameters.

DPM Glossary

A glossary of the more common terms associated with operating a digital picture manipulator is provided below.

ACTIVE VIDEO — The portion of a video signal that contains picture information.

ANTI-ALIASING — Aliasing is a stair-step effect created when a diagonal line is drawn across a raster. The line is broken up into discrete dots whose separation depends on the number of lines of resolution of the raster. Anti-aliasing is a technique whereby some of the pixels adjacent to the line are turned on at a lower intensity than the line itself, thus smoothing out the stair-step effect.

ASPECT — A transform which changes the ratio of the picture's width to its height, making it taller or wider than the original.

AUTO TRANSITION — An automatic transition in which the motion of the lever arm is electronically simulated when an AUTO TRANS pushbutton is pressed.

AXES — The X axis is a horizontal line through the center of the screen. The Y axis is a vertical line. The Z axis is in the third dimension, perpendicular to the X and Y axes; it indicates depth.

BACKGROUND GENERATOR — A video generator that produces a solid-color output which can be adjusted for hue, saturation, and luminance.

BANK — The E-MEM® Effects Memory system contains 100 memory registers. These are divided into ten banks numbered 0-9. Each bank contains ten memory registers numbered 0-9. The E-MEM® display shows the bank number on the left and the register number on the right.

COMBINER TRANSITION — A transition between the Channel 1 and (optional) Channel 2 signals. The priority of the channels and the type of transition are selectable through software.

BACKGROUND VIDEO — Video that forms the background scene into which a key may be inserted. Background video can be an external signal or matte: external background video comes from the BACKGROUND INPUTS BNCs on the back of the DPM frame; matte background is produced by a matte generator within the DPM.

BACK PORCH — The portion of a video signal that occurs during blanking from the end of sync to the beginning of active video.

BIAS — The characteristic of location/positioning which controls the direction of the motion path as it passes through a key frame position. For some effects, the operator may want to change the direction of the motion path so that it overshoots or undershoots the key frame position. This can be programmed into a key frame effect using the STREAMLINE™ {Effect} menu.

BLACK — A black video output generated within the digital picture manipulator and used in the fade to black function.

BLANKING — (1) The portion of the video signal during which picture information is shut off. Blanking is a voltage level below the picture level and acts as a signal to turn off the scanning beam. The synchronizing signals which control retrace of scanning are present during blanking. (2) A standard signal from a television sync generator used to create blanking in video.

BLANKING PROCESSOR — A circuit on the output processing amplifier which strips blanking and sync from the program output and replaces it with blanking and sync from a reference source. This process ensures that sync and blanking on the final output does not contain any unwanted noise or level shifts.

BOARD — Generically, a printed circuit board. In the DPM manuals, "board" refers to a printed circuit board which contains electronic components and which is a part of the control panel assembly. (As opposed to a "module," which is a printed circuit board which contains electronic components and which slides into the electronics frame.)

BRIGHTNESS — The relative intensity of light determined by the sum of responses of the eye to the component wavelengths.

CAPTION — See Title.

CHANNEL — A digital effects processing path for video.

CHARACTER GENERATOR — A device used to generate text or captions for television broadcast.

CHROMA, CHROMATICITY — The attribute of light combining hue and saturation independent of intensity. The color perceived is determined by the relative proportions of the three primaries.

CHROMINANCE — The colormetric difference. The level of chrominance corresponds to the sensation of saturation.

CLIP — A threshold level adjustment to which the key source attribute (chrominance, luminance, etc.) is compared. In luminance keying, any video (brightness) level above the clip level will insert the key; any level below the clip level will turn the key off. The clip level is adjusted to produce an optimum key free of noise and tearing. In the KEY INVERT mode, this clip relationship is reversed, allowing video below the clip level to be keyed in. This is used for keying from dark graphics on a light background.

COLOR BACKGROUND GENERATOR — A circuit that generates a full-field solid color (matte) for use as a background in a video picture.

COLOR BARS — A video test signal widely used for system and monitor setup.

COLOR BLACK — A composite video signal that produces a black screen when viewed on a television receiver.

COLOR BURST — A nine-cycle (ten-cycle for PAL) burst of color subcarrier which is imposed on a video signal after sync. Color burst serves as the reference for establishing the picture color.

COLOR FRAME — In NTSC color television systems, one color frame is equal to four fields.

COMBINER — A device which is part of the Second Channel option and which controls the way in which the two channels work together. The Combiner, under software control, determines the priority of the two channels (which appears in front of the other) and the types of transitions which can take place between them.

COMPOSITE SYNC — A signal in which horizontal and vertical sync pulses are combined. Sync is used by source and monitoring equipment for timing purposes. Also referred to as sync or CS.

COMPOSITE VIDEO — A video signal that contains horizontal, vertical, and color synchronizing information.

CONTINUITY — The characteristic of location/positioning which determines whether the motion path continues smoothly, without interruption. For some effects, such as animating a bouncing ball, the operator may want to introduce a discontinuity in the motion at the point of impact. This can be programmed into a key frame effect using the STREAMLINE™ {Effect} menu.

CONTROL SIGNAL — A signal used to moderate the mixing of video signals.

CONTROL PROCESSOR — Circuits used to generate or alter control signals.

CROSSPOINT — An electronic switch, usually controlled by a pushbutton on the panel, that allows video or audio to pass when the switch is closed.

CURRENT EFFECT SPACE — The key frame current effect space is the memory space used to store a key frame effect as you create or edit it. That is, any time you work on a key frame effect, it must be stored in this memory space. Key frame effects in the current effect space can also be monitored and run, using the TRANSITION section of the control panel.

CURRENT TIME — The current position in the current effect. All channels in an effect always have the same current time and will be processed together. Current time is expressed in terms of seconds and frames from the start of the effect. Negative times fall before the start of the effect.

CUT, TAKE — A direct instantaneous switch between two video signals. The switch occurs during the vertical interval to prevent disruption of the picture.

DEFAULT VALUE — A value which will be assigned to a parameter automatically unless the operator enters a different value. For example, new key frames are given a default duration time of 60 fields when they are created *unless* the operator has specified a different duration time.

DELAY DISTRIBUTION AMPLIFIER — A distribution amplifier that can introduce adjustable delay into a video signal path.

DELEGATION — The ability to assign controls—levers, pushbuttons, or control panel sections—to perform more than one function or to control more than one input, channel, etc., at different times. For example, the DPM control panel can be delegated to control either Ch 1 or Ch 2.

DISTRIBUTION AMPLIFIER — A device used to multiply (fan out) a single video signal. It may also have the ability to adjust cable equalization and/or delay. Referred to as a DA.

DOWNSTREAM KEYER — A term used for a keyer that inserts the key "downstream" of the effects system video output (Clean Feed). This enables the key to remain on-air while the backgrounds are changed behind it.

DRIVE PULSES — A set of signals needed by some source equipment for timing purposes. The signal set may be composed of any of the following: sync, blanking, subcarrier, horizontal drive, vertical drive, and burst flag.

EDITOR — A control system (usually computerized) which allows the control of video tape machines, video switchers, and other devices remotely from a single control panel. Editors enable the production of finished video programs which combine videotape or effects from several different sources.

EFFECT — An effect or key frame effect is a sequence of key frames. An effect can reside in the key frame current effect space, in an E-MEM® effects memory register, or on a disk. It may use either one or two channels.

E-MEM® EFFECTS MEMORY — A Grass Valley Group system which is used to store effects for later recall.

ENCODED CHROMA KEY — A chroma key which uses an encoded video signal (e.g., from a video tape recorder) instead of separate RGB or Y, C_R, C_B signals for deriving the key.

EQUALIZATION — The process of altering the frequency response of a video amplifier to compensate for high-frequency losses in coaxial cable.

EQUALIZING PULSES — A series of pulses occurring at twice the line frequency before and after the serrated vertical synchronizing pulse. They are used to adjust the scanning sequence for proper interlace.

EXTERNAL KEY — An input signal to the switcher which is used exclusively as a key source. Typically this key source is selected automatically with the selection of the key fill.

FADE TO BLACK — A transition which takes the output of the system to black, or brings it up from black if it is already there.

FIELD — A television picture is produced by scanning the television screen with an electron beam. One complete scan of the screen is called a field. Two interlaced fields are required to make a complete picture, which is called a frame. The duration of a field is approximately 1/60 of a second in NTSC or PAL-M and 1/50 of a second in PAL.

FILL — The video information that fills the "hole" cut in the video picture by the key signal. See "key" for further details.

FRAME — (1) A television frame forms one complete picture. It consists of two interlaced fields. (2) An electronics frame is the cabinet, usually rack-mounted, which contains the DPM's electronics modules.

FRAME SYNCHRONIZER — A digital buffer that continuously adjusts a video signal for timing errors by storing it, comparing its sync information to a reference, and then timing the release of the video signal to be in correct time.

FREQUENCY RESPONSE — The ability to maintain a uniform video signal level (amplitude) over a range of difference frequencies.

FRONT PORCH — The portion of the video signal that occurs during blanking and extends from the end of active video to the beginning of sync.

GAIN — An adjustment of the amplification factor applied to the key source attribute (chrominance, hue, luminance, etc.) to be used for keying. Adjusting the gain affects the sharpness of the keying edge.

GLOBAL CONTROL — Global control provides an additional, separate set of parameters for the system. For example, you could spin a picture using its own parameters and, at the same time, orbit it using the global parameters to establish the orbit point. Global control also ties together Channel 1 and Channel 2 . This lets you combine separate pictures from the two channels and then manipulate them together, as if they were a single picture. The global channel is handled like a single channel for effects editing.

GLOBAL CONTROL MODE — In global control mode, the control panel is delegated to the global parameters. Operationally it is similar to operating a single channel, but it allows you to combine the two video channels and manipulate them together.

GROUP DELAY — A defect in a video signal caused because different frequencies have different propagation delays (for example, delay at 1 MHz is different from delay at 5 MHz). This defect causes an object's color to shift outside its outline.

HORIZONTAL SYNC PULSE — The synchronizing (timing) pulse at the end of each line that determines the start of horizontal retrace.

HUE — The attribute of light (wavelength, frequency) which determines the color perceived (red, blue, green etc.). Hue is specified by phase relative to color burst. Any saturated color which is not one of the three primaries may be treated as a combination of two primaries.

INBETWEENING — Inbetweening is the process that defines what happens to the picture as it moves from one key frame to the next in the sequence. That is, it generates the necessary intermediate field rate information to control the transition. This transition between key frames is defined by the operator during programming and can be instantaneous, linear, or a curve created by the system based on previous and future key frames. Inbetweening is also referred to as key frame interpolation or splining.

INPUT — A video input to the DPM system which can be manipulated using transforms, programmed motion paths, etc.

JITTER — Jitter is a random aberration in the time period due to noise or time base instability.

KEY — (1) An effect where a video scene or caption is inserted into a background video scene. (2) The signal which is used to pass or block portions of the video signal associated with the key effect. This key source signal determines the shape of the insert in a key effect by "cutting a hole" in the background video for the insertion of other elements such as text or a smaller video picture.

KEY FILL — In key effects, the video signal which is said to "fill the hole" cut in background video by the key source.

KEY FRAME — A key frame is an instant of time specified by the builder of an effect. At that instant, the picture is completely defined by parameters entered by the operator. Since a key frame is the minimum unit of time in an effect, it is the key to what the effect is doing (picture and motion) at that time. A key frame defines all possible parameters for that point in time, including picture size and position, sources, recursive effects, background, and borders. A series of key frame in sequence defines an effect, with a process called inbetweening defining what happens between key frames.

KEY FRAME CURRENT EFFECT SPACE — The key frame current effect space is the memory space used to store a key frame effect as you create or edit it. That is, any time you work on a key frame effect, it must be stored in this memory space. Key frame effects in the current effect space can also be monitored and run, using the TRANSITION section of the control panel.

KEY FRAME DURATION — The time it takes for one key frame to change to the next key frame in an effect sequence. The default time will be 60 fields (30 frames, or about one second). The duration can be adjusted using the DIRECT ENTRY [KF DUR] function.

KEY FRAME EFFECT — A key frame effect is a series of key frame in sequence. A process called inbetweening defines what happens between key frames.

KEY SOURCE — The source of the signal which is said to "cut the hole" in the background scene for a key effect. In actuality, this signal is processed into a key which controls the video mix between the background scene and the fill video; thus the key source determines the shape of the key effect.

KEY VIDEO — The key fill, the key source, or both.

LINEAR KEY — A special type of luminance key which is processed near unity gain by the switcher. Clip and gain have a very small adjustment range and keying is performed using the absolute signal level of the key source. A linear key is used when the key has already been properly shaped at the key source.

LINEAR PULSE DISTRIBUTION AMPLIFIER — A linear pulse DA can handle 4V p-p signals (pulses) but is limited to amplifying and fanning out the signal. It cannot reconstruct the signal or allow for adjustment of delay as a regenerative pulse DA can.

LOCATION — A transform which allows you to move the DPM picture

along the X,Y, and Z axes. The picture can be moved off screen.

LOOPING, LOOP-THROUGH — An input that includes two connectors. One connector accepts the input signal, and the other connector is used as an output for connecting the input signal to another piece of equipment or to a monitor.

LUMINANCE — The attribute of light which determines a color's brightness.

LUMINANCE KEY — A key effect in which the portions of the key source that are greater in luminance than the clip level cut the hole in the background scene. The clip level is determined by adjusting the CLIP control.

MANIPULATION — The various processes used to alter video input to the DPM, such as transformations and programming key effect sequences.

MASK — A pattern used to isolate a desired area of the screen.

MASK KEY — A key effect in which the keying signal is masked (gated) by an adjustable mask window. The top, bottom, left, and right edges of the mask can be positioned anywhere on the screen. The mask may be selected to force either foreground or background as desired.

MASTER REFERENCE SYNCHRONIZING GENERATOR — A synchronizing pulse generator that serves as the precision timing reference for an entire teleproduction facility.

MATTE — An internally-generated, full-field solid color signal which is adjustable for luminance, hue, and saturation. Mattes are used as background for keys and for borders.

MATTE KEY — A key effect which employs matte as the insert signal.

MATRIX — An array of input and output signal lines whose intersections form crosspoints.

MIX, DISSOLVE, CROSSFADE — A transition between two video signals in which one signal is faded down as the other is faded up. A constant video output level is maintained at all times.

MIX/EFFECTS (M/E) — An electronic system capable of processing video signals with other video signals and/or electronic control signals.

MIXER — A control circuit in which one or more non-video control signals are multiplied with two or more input video signals. The resulting video output level varies according to the state of the control signals.

MODULE — In the DPM manuals, "module" refers to a printed circuit board which contains electronic components.

MONTAGE EFFECT — This is a recursive effect which develops over time. At each point in an effect where a key frame occurs, a new picture will be displayed; the previous key frame pictures are kept on screen as well.

MOSAIC EFFECT — A digital video effect where the picture seems to be made up of a number of small squares or tiles.

MULTIPLIER — An electronic control circuit, the output of which is the product of a video input and a control input, or the product of two control signal inputs.

NON-ADDITIVE MIX (NAM) — A transition between two video signals in which the signal with the largest instantaneous amplitude is passed.

NTSC — The color television transmission standard developed in the United States by the National Television System Committee. This standard uses a 3.579545 MHz subcarrier whose phase varies with the instantaneous hue of the televised color, and whose amplitude varies with the instantaneous saturation of the color. A single frame (picture) in this standard consists of 525 scanning lines. One frame is shown every 1/29.94 of a second.

OUTPUT — Outputs are the manipulated video produced by the DPM system; they can be used for distribution or as inputs to another video device. The DPM has three basic outputs: Clean Feed, which is the manipulated video taken before the downstream keyer; Program, which is the manipulated video after the downstream keyer; and Key, which is the same video as Clean Feed but which is provided as a key signal.

PAL (PHASE ALTERNATION BY LINE) — The colour television transmission standard used in Europe and other parts of the world. This standard uses a subcarrier which is alternated in phase from one line to the next to minimize hue errors in colour transmission. PAL-I uses a 4.43361875 MHz subcarrier. A single frame (picture) in this standard consists of 625 scanning lines. One frame is produced every 1/25 of a second. PAL-M uses a 3.57561149 MHz subcarrier and 525 scanning lines. One frame is produced every 1/30 of a second.

PARAMETER — A variable quantity or quality (size, position, color, etc.) that restricts or gives a particular form to the thing it characterizes.

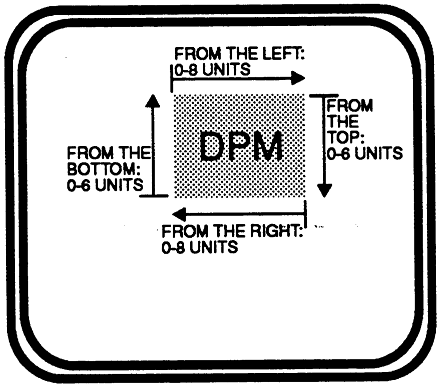
PATH LENGTH — The time it takes for a signal to travel through a piece of equipment or a length of cable. Also called propagation delay.

PHASING — Adjusting the delay of a video signal to a reference video signal to make sure they are synchronous (in time). This includes horizontal and subcarrier timing.

PICK-OFF JITTER — Jitter is a random aberration in the time period due to noise or time base instability. Pick-off refers to the sample point selected.

PICTURE UNITS — Picture units are units of measurement which are defined in terms of the manipulated picture itself rather than in terms of the video monitor (see the picture on the next page). Each picture, no matter what its size or location on the screen, is eight units across and six units up and down. The center of the picture is 0,0. Picture units are used for border placement, cropping, and split/mirror effects.

PIXEL — Pixel is short for "picture element," which is the smallest



PICTURE UNITS

element of a video picture. That is, a picture is actually made up of a large number of adjacent units or dots, each of which can be lighted and/or colored differently. The number of pixels determines the fineness of the picture resolution; more pixels produce better resolution.

POSITIONING — See Location.

POSTERIZATION — A process which averages groups of colors to remove gradations and create steps. In the DPM, the 256 possible colors can be converted to as few as eight different colors, producing a poster effect. The slope, offset, and levels of the colors are adjustable.

PRODUCTION SWITCHER — A device that allows transitions between different video pictures. It may also contain a simple special effects generator.

PROGRAM (PGM) OUTPUT — The on-air or final output of the DPM, taken after the downstream keyer.

PROPAGATION DELAY — The time it takes for a signal to travel through a piece of equipment or a length of cable.

PULSE DRIVES — A set of signals needed by some source equipment for timing purposes. The signal set may be composed of any of the following: sync, blanking, subcarrier, horizontal drive, vertical drive, and burst flag.

PULSE REGENERATOR — A module which accepts reference color black or another composite color video input and processes it to produce sync, blanking, subcarrier, and burst flag (PAL only) reference pulses for use within the switcher.

REFERENCE VIDEO SIGNAL — A composite video signal which is used as a timing reference. All other video signals in the system are compared to it.

REGENERATIVE DISTRIBUTION AMPLIFIER — A regenerative pulse DA can reconstruct a video signal and allows for adjustment of delay.

RGB — Red, green, blue; the three primary colors used in video transmission/reception, often referring to the three color component (unencoded) outputs of a color camera.

REGISTER — The E-MEM® Effects Memory system contains 100 memory registers. These are divided into ten banks numbered 0-9. Each bank contains ten memory registers numbered 0-9. The E-MEM® display shows the bank number on the left and the register number on the right.

SATURATION — The degree by which the eye perceives a color as departing from a gray or white scale of the same brightness. The amount of chroma in a color.

SC — SUBCARRIER. A continuous sine wave used by source equipment to encode color information into the video signal. Subcarrier is imposed on the luminance portion of the video signal and modulated to carry color information. A sample of subcarrier is included during horizontal blanking time and is called color burst. The frequency of subcarrier is 3.58 MHz in NTSC and 4.43 MHz in PAL.

SC/H PHASE — The phase relationship of the subcarrier to the leading edge of horizontal sync. SC/H phase is correct when the zero crossing of subcarrier is aligned with the 50% point of the leading edge of sync.

SELECTED KEY FRAME — See Current Key Frame.

SELF KEY — A key effect in which the DPM's key video signal is used for both the key source (the "hole cutter") and the key fill.

SIZE — A transform which allows you to change the size of the DPM picture from 100 times its original size down to 0%.

SKEWING — A transform which changes the shape of the picture by pulling the top and bottom or the left and right sides in opposite directions (for example, the top will be pulled to the left while the bottom moves to the right, causing the picture to slant).

SOFT EDGE — A pattern edge between two video signals in which the signals are mixed together for a soft transition effect.

SOFT PANEL — The STREAMLINE™ control panel, which is controlled by software. That is, the pushbuttons, control knob, and display do not have a single dedicated function; instead they change function depending on which program is currently running.

SOURCE — A device which produces a video output, such as a digital picture manipulator, a camera, a tape recorder, or a character generator.

SOURCE SYNCHRONIZING GENERATOR — A synchronizing pulse generator used to drive one specific piece of source equipment. It is referenced to a master reference synchronizing generator.

SPG — SYNCHRONIZING PULSE GENERATOR. A device which generates the synchronizing (timing) pulses needed by source equipment.

SUBCARRIER — A continuous sine wave used by source equipment to encode color information into the video signal. Subcarrier is imposed on the luminance portion of the video signal and modulated to carry color information. A sample of subcarrier is included during horizontal blanking time and is called color burst. The frequency of subcarrier is 3.58 MHz in NTSC and 4.43 MHz in PAL.

SUBMODULE — In the DPM manuals, "submodule" refers to a printed circuit board (often an option) which contains electronic components and which is physically installed on a larger module.

SYNCHRONIZATION — The state which exists when the video signals in a system are all in time with a reference video signal (and, therefore, with each other). Synchronization includes both horizontal and subcarrier timing. When video signals are synchronized, their line scanning sequences all start at the same time and stay together in time. If they didn't, the video output would roll, jump, tear, or have incorrect color when the signals are combined.

SYNCHRONIZING PULSE GENERATOR — A device which generates the synchronizing (timing) pulses needed by source equipment. Also known as a sync generator or SPG.

SYNC TO SUBCARRIER TIME BASE ERROR — A random variation in the phase relationship between sync and subcarrier.

SWITCHER — A device that allows transitions between different video pictures. It may also contain a simple special effects generator.

SYNC — The portion of an encoded video signal which occurs during blanking and is used to synchronize the operation of cameras, monitors, and other equipment. Horizontal sync occurs during the blanking period in each horizontal scanning line, and vertical sync occurs during the vertical blanking period.

TALLY — A lamp which lights up to indicate that a pushbutton is active or has been selected; a status indicator.

TENSION — The characteristic of location/positioning which determines how sharply the curve bends at a key frame position. For some effects, the operator may want to adjust the tension of the motion path and change the amount of curve at the key frame position. This can be programmed into a key frame effect using the STREAMLINE™ {Effect} menu.

TERMINATE, TERMINATION — To close off a circuit by connecting a resistive load to it. A video termination is typically a male BNC connector which contains a 75 ohm resistive load. Any unused looping inputs on the DPM must be terminated in 75 ohms to ensure proper signal levels.

TIME BASE CORRECTOR — A device used to stabilize the timing of a tape machine so it will meet FCC specifications and match other sources used in your video production facility.

TIMING — Adjusting the delay of a video signal to a reference video signal to make sure they are synchronous (in time). This includes horizontal and subcarrier timing.

TIMING REFERENCE VIDEO SIGNAL — A composite video signal which is used as a timing reference. All other video signals in the system are compared to it.

TITLE — A video signal representing words which are to be keyed over a background. The source of the title video may be a character generator, graphics camera, etc.

TRANSFORM, TRANSFORMATION — The act of digitally changing a video picture; a picture manipulation which changes the appearance or location of the picture. Transforms include changing the location, size, and aspect of a picture, and spinning.

TRANSITION — A change from one picture to another. The DPM can perform keyer, fade to black, and combiner transitions. A DPM transition can be an automatic mix, a manual mix, or a cut.

VERTICAL INTERVAL — The portion of the video signal that occurs between the end of one field and the beginning of the next. During this time, the electron beams in the camera and monitors are turned off so that they can return from the bottom of the screen to the top to begin another scan.

VERTICAL SERRATIONS — A number of small notches which occur in each vertical synchronizing pulse. They keep a television receiver's horizontal sync circuitry from drifting off frequency during the time when no horizontal picture information is present.

VERTICAL SYNC PULSE — The synchronizing (timing) pulse at the end of each field that signals the start of vertical retrace.

VIDEO — An electrical signal used to carry visual information. Composite video includes sync and blanking signals. Non-composite video does not include sync and blanking.

VIDEO PROCESSING AMPLIFIER — A device that stabilizes the composite video signal, regenerates the synchronizing pulses, and can make other adjustments to the video signal.

VIDEO TIME BASE ERROR — A defect caused when all of the components of the video signal jitter (change in time) together in relation to another video signal.

WORKING KEY FRAME BUFFER — The working key frame buffer is a memory space which holds the parameters for a single key frame picture. This buffer is the work space for creating and editing key frame effects. It can be controlled in two ways: (1) Whenever you use thecontrol panel to set up or to change a key frame, the changes all take place to the key frame in the working key frame buffer. This key frame is then entered into a key frame effect using the [INSERT BEFORE], [INSERT AFTER], or [REPLCE] pushbuttons. (2) As you run or otherwise move through the key frame effect which is in the current effect space, a copy of the currently selected point in the effect will be automatically placed in the working key frame buffer.

Y, C_R, C_B — A set of color component signals separating luminance and chrominance. RGB may be resolved into the CCIR weighted luminance, Y = 30% R + 59% G + 11% B, and two color difference signals, C_R = Y - R and C_B = Y - B.

ZERO TIMING POINT — The point in your video system at which all video signals must be in synchronization. Typically this will be at the switcher inputs.

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